BUS. ADM.
BUS. ADM. LIBRARY
HB
1
.095
n.s.
v.10
no.2
3-DAY LOAN

OXFORD ECONOMIC PAPERS

UNIVERSITY OF MICHIGAN
JUL 15 1958
BUSINESS ADMINISTRATION LIBRARY

(NEW SERIES)

VOLUME 10 JUNE 1958 NUMBER 2

Editorial Board: T. WILSON (*General Editor*), J. R. HICKS
C. M. KENNEDY, SIR DONALD MACDOUGALL, C. N. WARD-PERKINS
N. H. LEYLAND (*Secretary*)

CONTENTS

The Measurement of Real Income. By J. R. HICKS . . . 125

Is the National Debt a Burden? By J. E. MEADE 163

Automatic Market Clearance and Innovations in the Theory of Employment and Growth. By W. FELLNER 184

An Integration of Employment Economics Within the Keynesian Theory of Money Flows. By H. VANDENBORRE 205

Productivity and Inflation. By T. BALOGH 220

Prices, Productivity, and Incomes. By G. D. N. WORSWICK . . 246

OXFORD
AT THE CLARENDON PRESS
1958

OXFORD ECONOMIC PAPERS

(NEW SERIES)

OXFORD ECONOMIC PAPERS, of which eight numbers appeared at irregular intervals between 1938 and 1947, became a periodical in 1949 and is now published three times a year. The pre-paid subscription price is 35*s*., post free, and the price of a single copy 16*s*. net. Orders may be placed with any bookseller or sent direct to the Publisher.

PAPERS should be sent to the General Editor, c/o The Clarendon Press, Oxford. Contributors receive 50 free offprints. All correspondence other than that dealing with contributions should be addressed to the publishers:

OXFORD UNIVERSITY PRESS
AMEN HOUSE, LONDON, E.C. 4

Stability and Progress in the World Economy

Edited by D. C. HAGUE

The five main addresses by leading economists and subsequent discussions of the Congress of the International Economic Association, Rome 1956. 25*s*

The Economics of International Migration

Edited by BRINLEY THOMAS

Twenty-four papers by leading experts and a record of the discussions at the seventh conference of the International Economic Association. 45*s*

The Political System of Napoleon III

THEODORE ZELDIN

This interesting work seeks to explain the transformation of Napoleon III from an absolute ruler to a constitutional monarch divested of most of his power. 24*s*

MACMILLAN & CO LTD

ST MARTIN'S STREET LONDON WC2

Oxford Economic Papers (new series)

BUS. ADM. LIBRARY
HB
1
.095
V.10
no.2

PITMAN

ECONOMICS

By FREDERIC BENHAM. Fifth Edition. 20*s. net*

Famous as a complete introduction to the science of Economics —this book gives a realistic account of how the economic system works today in a country such as ours. Although written mainly for first year university students it will also be useful to those taking Civil Service and other professional examinations.

THE SUBSTANCE OF ECONOMICS

By H. A. SILVERMAN. Fourteenth Edition. 20*s.*

For the student and general reader, this is undoubtedly one of the best introductions to basic economic principles. It will be indispensable to those who need a grounding in economics for examination purposes.

A COURSE IN APPLIED ECONOMICS

By E. H. PHELPS BROWN, M.B.E., M.A., &c. 27*s.* 6*d. net*

The problems analysed in this book are all of present importance so that together they provide a comprehensive introduction to the role of economics in contemporary politics.

ELEMENTS OF ECONOMICS

By S. EVELYN THOMAS, B.CON., PH.D., &c. Tenth Edition. 30*s. net*

The author here particularly considers the problem of modern industrial organization and international currency. The work is of the highest quality and will be indispensable as a text-book for all students of economics.

A FIRST APPROACH TO ECONOMICS

By E. VICTOR MORGAN. 21*s. net*

This book provides a simple, uncomplicated introduction to the abstract ideas of economic theory. Based on a course which the author has given to first year university students, the book is designed to take the undergraduate to the point at which he enters the honours school.

Parker Street, Kingsway, London W.C. 2

SOCIAL AND ECONOMIC STUDIES

A Journal devoted to research, especially in the problems of economic growth, social change, and political action in underdeveloped territories

Special Number

Vol. 6 JUNE 1957 No. 2

Federation of the West Indies

CONTENTS

Introduction — PAUL KNAPLUND

Government in the British West Indies: An Historical Outline — RONALD V. SIRES

Progress towards Federation — LLOYD BRAITHWAITE

Two Federations — DAVID LOWENTHAL

Federation of the British West Indies: The Economic and Financial Aspects — DUDLEY SEERS

West Indian Federation: The Constitutional Aspects — GORDON K. LEWIS

Political Aspects of Federation — MORLEY AYEARST

Some Demographic Considerations of West Indian Federation — G. W. ROBERTS

'Federal' Associations and Institutions in the British West Indies — LLOYD BRAITHWAITE

Annual subscription per volume (4 numbers) £1. 10*s.* 0*d.*; U.S.A., $4.25; B.W.I., $7.20. Single copies of special Federation number, with board covers, 12*s.* 6*d.*, post free

Institute of Social and Economic Research
University College of the West Indies
Mona, Jamaica, B.W.I.

INDIAN JOURNAL OF ECONOMICS

(Established 1916)

Editor: DR. OM PRAKASH

Volume XXXVIII July 1957 No. 148

SPECIAL NUMBER ON INTERNATIONAL ECONOMIC PROBLEMS

ARTICLES:

Symptoms of Economic Development — OM PRAKASH
An International Economic Policy — J. TINBERGEN
Some Reflections on the Concept of 'Disguised Unemployment' — JACOB VINER
Defects in the Concept of Regionalism to solve Trading Problems — GOTTFRIED HABERLER
Partial—Vs. General—Equilibrium in International Trade — C. P. KINDLEBERGER
Discriminatory Tariff Reduction: A Marshallian Analysis — HARRY G. JOHNSON
Future of World Trade — S. L. PARMAR
Overseas Borrowing: The New Model — H. W. ARNDT
Money and Banking Problems in the British Colonies — A. HASIB
Some Aspects of Fiscal Policy in Underdeveloped Economies — B. K. SINGH
The Problem of Factor Proportions in Underdeveloped Economies — A. D. SHARMA
Revealed Preference for Indian Jute — GEORGE K. CHACKO

NOTES AND MEMORANDA:

Activity Analysis and the Theory of Economic Equilibrium — J. K. MEHTA
Financial Aspects of the Constitution of Pakistan — M. S. BHATIA
A Note on International Economic Relations — MAHESH CHAND

ECONOMIC LITERATURE

Annual Subscription (four issues) Rs 17, 26 shillings or $3.80. This Special Number costs Rs 6.50, 10 shillings or $1.50 up to December 31, 1958; and Rs 8, 12 shillings and sixpence or $1.80 thereafter.
Write to the Managing Editor, Indian Journal of Economics, University of Allahabad, Allahabad-2 (INDIA).

ECONOMICA

Published Quarterly

ECONOMICA is published quarterly by the London School of Economics and Political Science, in February, May, August, and November, and is devoted to research in the fields of Economics, Economic History, and Statistics. The Journal is under the direction of an editorial board composed of Professor R. G. D. Allen, Professor W. T. Baxter, Professor E. H. Phelps Brown, Sir Sydney Caine, Professor R. S. Edwards, Professor F. J. Fisher, Professor F. W. Paish, Professor Sir Arnold Plant, Professor Lionel Robbins, Professor R. S. Sayers (Acting Editor), with Mr. B. S. Yamey as Assistant Editor.

38th year. New Series. Volume XXV. No. 97. February 1958

CONTENTS

The Problem of 'Success Indicators' in Soviet Industry	*A. Nove*
Movements in Retail Prices Since 1953	*R. G. D. Allen*
Behaviourist Cardinalism in Utility Theory	*Tapas Majumdar*
The Theory of the Economic Effects of Government Expenditure in English Classical Political Economy	*B. A. Corry*
A Note on the Early History of Consumer's Surplus	*R. W. Houghton*
Input-Output Approach in an Allocation System	*A. Ghosh*

BOOK REVIEWS BOOKS RECEIVED

The price of ECONOMICA (New Series) is 10*s*. 0*d*. a number, or £1. 10*s*. per annum, post free. Copies may be obtained on order from the Publications Department of the London School of Economics, Houghton Street, Aldwych, London, W.C. 2, to which address all subscriptions and business communications should be sent.

SCOTTISH JOURNAL OF POLITICAL ECONOMY

(The Journal of the Scottish Economic Society)

VOL. V JUNE 1958 No. 2

Special Issue on Wages Policy

Introduction	A. K. CAIRNCROSS
Wage Stability and Employment	J. R. PARKINSON
The Inadequacy of Recent Wage Policies in Britain	D. J. ROBERTSON
Can Britain Have a Wage Policy ?	A. FLANDERS
Wage Policies Abroad	T. L. JOHNSTON
Comments and Criticisms	

SCOTTISH JOURNAL OF POLITICAL ECONOMY is published in February, June, and October, and is free to members of the Scottish Economic Society. Applications for membership should be made to the Treasurer, Scottish Economic Society, 142 St. Vincent Street, Glasgow, C. 2, enclosing the annual subscription of £1. 5*s*. 0*d*. The Journal may also be obtained by non-members of the Society by ordering through any bookseller or direct from the Publisher, Oliver & Boyd, Tweeddale Court, Edinburgh, price 10*s*. per single copy.

The Development of the Soviet Budgetary System

R. W. DAVIES

Are the budgetary arrangements of the Soviet efficient, and do they seem appropriate? Dr Davies traces the emergence and growth of their budgetary system between 1917 and 1941. There is a foreword by Professor Alexander Baykov.

45s. net

Economic Analysis & Policy in Underdeveloped Countries

P. T. BAUER

A study of appropriate economic methods for underdeveloped countries, with a discussion of some policy problems, based on a series of lectures delivered at the Duke University Commonwealth-Studies Center. *22s. 6d. net*

The Control of Inflation

J. E. MEADE

In his inaugural lecture in the Chair of Political Economy at Cambridge, Professor Meade considers the best way to stop the continuing inflation of prices, and suggests measures to obtain price stability with full employment. *5s. net*

CAMBRIDGE UNIVERSITY PRESS

BENTLEY HOUSE, 200 EUSTON ROAD, LONDON, N.W. I

THE MEASUREMENT OF REAL INCOME

By J. R. HICKS

I. Introductory

1. The scope of this paper may be explained most conveniently if I present it as a 'revision' of my much-controverted 1940 paper on Valuation,[1] just as my recent book on Demand Theory[2] was a revision of the corresponding sections in *Value and Capital.*

There were two main contentions in the 1940 paper: (1) that measurement in real terms may mean valuation in respect of utility, or in respect of cost, and that these meanings are in principle different; (2) that the utility measure is independent of the possibility of aggregating utilities. The first of these contentions appears to have stood up quite well to the fire of controversy; though there has been some criticism of the practical consequences which I drew from it,[3] the theoretical validity of the distinction itself remains unimpugned. But the second, as presented, has been shown to be fallacious. How much remains, when this error has been corrected, is a matter that has been much discussed by others; but I think that I have some right (or perhaps duty) to examine it myself.[4]

I propose in this paper to take for granted the distinction between cost and utility measures; and to concentrate attention upon the utility measure—the valuation of the Social Income on the side of utility. This

[1] 'The Valuation of the Social Income' (*Economica*, 1940); hereinafter cited as V.S.I.

[2] *A Revision of Demand Theory* (Oxford, 1956); hereinafter cited as *R.D.T.* I may perhaps allude to the distinction which I make in that book to the two uses of Demand Theory—the Econometric use and the use in Welfare Economics. It can well be doubted, as my critics have not been slow to point out, whether it was sensible to take a purely static theory and to develop it, solely for econometric purposes, quite as far as I did develop it in my book. I should indeed myself have been shy of doing this if I had not had the other purpose in mind also. Though I am not yet ready with the companion volume on this other application, which is obviously called for, some of the main things which I have to say in that direction will emerge in the course of the present paper.

[3] As by Kuznets, 'The Valuation of the Social Income' (*Economica*, 1948). That the existence of indirect taxes does not necessarily imply a divergence between prices and social costs (since the taxes may do no more than cover the contributions to production of public services that are not otherwise paid for) is a point that may be accepted. But it is most difficult to see that such a correspondence can be generally valid. I should even have thought that the statistician would get himself into the most perplexing difficulties if he merely assumed, as a convention, that it could always (even in a 'Welfare state') be taken to exist.

[4] I have so much to do in the way of constructive work in this essay that I must beg to be excused from any survey of the extensive literature on 'New Welfare Economics', highly relevant as much of it is to what I shall be saying. Some reference must however be made to Samuelson's 'Evaluation of Real Income' (*O.E.P.* 1950); I have learned more from that article than from any other source, in relation to the particular matters which I shall be discussing. Much of what follows is no more than the imposition of a somewhat different 'slant' upon Samuelson's argument.

is not because I am uninterested in the cost measure. I now think that in my 1940 article I claimed too little for the cost measure (perhaps because, as a result of the mistake in my argument, I was claiming too much for the other). After all it is the cost interpretation, in terms of resources applied, which is the interpretation which for most purposes we mainly want. Social Accounting proceeds for the most part in terms of Factor Cost; and I do not question that it is generally right to do so. The elucidation of the cost measure may therefore be a more important task than the elucidation of the utility measure. Nevertheless, it is the utility measure which has been the object of most of the theoretical controversy; and I have quite enough to say about it to occupy the present essay. Somewhat regretfully, therefore, I shall put the cost measure on one side.[1]

2. I have been speaking rather loosely about utility and cost 'measures'. I should, however, make clear at the beginning of our discussion that the basic distinction is not one between different measures, in the statistical sense; it is a distinction between different interpretations. The statistical measure of Real Income which we are examining is throughout a simple price-weighted index-number of $\sum pq$ type. Our problem is not one of the kind of measure to use, for we have no choice about that; it is a problem of the meaning which we can give to the measures which we have to employ.

It is true that the question of meaning reacts back on the statistical problems of measurement. There are many components of the Social Income which do not have well-defined prices, so that we have to look to the purpose of the calculation in order to get guidance on what price to apply. (The celebrated case of indirect taxes may be taken as the leading example of this; but the issue arises in other connexions also. There are goods which we may want to include though they do not have a price, such as food consumed on farms. There are goods with administered or controlled prices, where we may doubt whether the price given to us is the price we really want. Finally, there is the general problem of stock accumulation and fixed capital depreciation, items which may be ultimately priced, but where the relevant prices do not fall within the period under consideration.) It is worth remembering these problems, because they serve to show that our inquiry has a practical bearing. But we cannot deal with them until after we have made up our minds on the theoretical issue. The first thing to be done is to determine the meanings that can be given to the concept of Real Income, and the relation between those meanings and the index-number measure, taken (for the present) in a simple and uncomplicated sense.

Nevertheless, when the matter is looked at in this way (with the results

[1] Though I shall come back to it at the end (see below, p. 161).

which have emerged from the controversies of these last years in our minds), there is one negative result which we can already foresee. We must not expect to find *any* general meaning which a price-weighted index-number (however skilfully constructed) can always, in all circumstances, be relied upon to express. Or, if there is any such meaning, it is something so empty and formal as to be scarcely interesting. We have been beaten back from the search for that Philosopher's Stone; but more modest objectives may still lie within reach. If we merely look for meanings which can often, or perhaps usually, be ascribed to our index-numbers, we are looking for something which may be more attainable.

But if we do limit ourselves in that way, there is a further duty, not previously noticed, which is laid upon us. We should be looking for criteria of reliability. We should be seeking for tests which would tell us when the verdict of the index-numbers is a good verdict and when it is open to suspicion. What we want is something which corresponds, on the theoretical plane, to the statisticians' 'standard error'. What we want is some better means of telling, in a practical instance, whether we are talking sense or not.

That is the general direction in which I want to turn my inquiry. But we shall only reach that point at the end of a fairly long discussion. It is necessary to begin much farther back.

II. The 'Classical' Assumptions

3. Since the real social income is made up out of flows of different sorts of goods and services (together with increments—and perhaps decrements—in the stocks of various sorts of capital goods), any method of measuring it implies a rule for establishing an equivalence between goods of different kinds. The simplest rule of equivalence is equivalence of market price; but though we are bound to rely on that equivalence very largely in practice, we cannot (for the reasons just explained) accept it as an ultimate criterion. We require some means of testing the suitability of the prices offered, and of penetrating into the penumbra where market prices cease to be available. Two alternatives then remain. Either we seek an equivalence in terms of cost—goods are equivalent if they are substitutable for one another, as alternatively producible from given resources; or we may seek it in terms of utility—goods are equivalent if they are substitutable for one another, as alternatively usable in the attainment of given ends.

Some conception of substitutability in use is, I think, essential to any attempt to measure real income on the utility side; but there is quite a gap between this general notion (which, to me at least, appears quite unexceptionable) and the specialized forms which are needed to make it an instrument of analysis. To make it a convenient instrument, we need some

special assumptions; and it must be freely admitted that the character of these assumptions is very questionable. It would be wrong to introduce them, if one proposed to leave them at the end wholly unmodified; but as a piece of scaffolding, by which one can mount up, so far as one is able, to a more general theory, they seem still to have a place.

The theory which is based on these assumptions needs a name; I have decided, after much hesitation, to call it the 'classical' utility theory. The theory which is to be associated with the classical economists, as that term is commonly used, is of course the theory of the cost measure; but we can surely recognize (in this mid-twentieth century) that utility has its classics as well as cost—neo-classics as some call them. It is not altogether wrong to mark some association between my classical theory and such 'classical' writings as those of Marshall and Pigou; but it would be wrong to label it with the name of any particular economist. For I am going to take the characteristic assumptions of the theory rather strictly; and when they are so taken it becomes obvious that they are too questionable to be accepted without reservation by any economist who has thought deeply about his subject. They can only be accepted, as I am here going to propose that they should be accepted, on a very provisional basis.

I shall accordingly set out the utility theory of the Social Income in two stages. First of all, I shall give the classical version (only, however, after explaining rather carefully why we are not to expect too much from it). I shall then go on to examine some ways in which we can relax the assumptions, so as to build up a utility theory which is not confined within quite such narrow bounds.

One special advantage which we shall derive from this procedure deserves mention at this point. Our decision to treat the classical theory as a provisional theory, due to be modified when the time comes, will enable us to make a fuller exploration of it, while we are concerned with it, than we should dare to do, if we proposed to make it our substantive theory, when we should be continually oppressed by its obvious weaknesses. This exploration will be very well worth while. For in the course of making it we shall discover techniques, which remain usable (at least to some extent) even when we modify the classical assumptions. One of the things which has been blocking a full development of the utility analysis has been a natural tendency to become preoccupied with its obvious weaknesses *too early on*.

4. The assumptions which are needed for the validity of the classical theory could be set out in a fairly long list; but it makes for convenience in handling if they are amalgamated into two. I shall call these the *Assumption of Integrated Wants* and the *Assumption of Revealed Wants* respectively.

(1) *Integrated wants.* If the wants that are to be satisfied by the set of

real goods included in income are integrated, it is possible to arrange all relevant alternative sets in a single consistent ordering. This may be a weak ordering,[1] in which some possible alternatives come on the same level; but it must be a complete ordering, which obeys the axiom (or axioms) of transitivity. Granted this assumption, it is possible to construct a Utility Function (or, to adopt Bergson's famous phrase, a Social Welfare Function), in which Utility is shown as a Function of the quantities of the various commodities. Instead of considering the outflow from the productive process as an output of physical commodities (as common sense, followed in this respect by the more general utility theory, has to regard it) we can allow ourselves, once we grant this assumption, to follow the Welfare economists in regarding it as an outflow of Utility.

The Integration assumption is accordingly equivalent to assuming that the further ends (to which all utility theory must regard the real commodities as means) can be subsumed under a single end; so that the physical outputs can be treated like inputs that co-operate in the production of one single product. Now if all inputs did co-operate in the production of one single product, the measurement of the Real Social Product would be a simple matter; we should simply look at the quantity of the single product that was produced. It has accordingly been tempting (it was a characteristic mark of the 'Old Welfare Economics' that it succumbed to the temptation) to think of the measurement of Income as being ultimately a measurement of this one (subjective) product—that is, of Utility. The productive system produces Economic Welfare; it produces more, the more Economic Welfare it produces.

The arguments which have been advanced against this notion are familiar; it is unnecessary, at this time of day, to go into them in detail. In the form in which the question of measurable utility arises in this place,[2] it is completely disposed of by the classic demonstration of Pareto: that the ordering of the sets, which is all that is required by the Integration assumption, does not suffice to determine a single Utility function.[3] If $u\,(q_1, q_2, \ldots, q_n)$ is a utility function which expresses the given ordering, then $f(u)$, where f is *any* increasing function of u, will express the same ordering, so that it will serve as a measure of utility just as well as u. The single 'product', utility, is a mere construct; it is inadequately defined to be an object of measurement. The idea of measuring utility, or welfare, as such, is a blind alley.

[1] *R.D.T.*, chs. 3–5.

[2] For a discussion of the same question in other contexts, see *R.D.T.*, ch. 2.

[3] It would of course have been more correct, historically, if I had taken the Integration assumption to include the specification of a determinate utility function. But I shall hope to convince the reader that this would have been a less fruitful way of arranging the argument.

It is, however, of much more importance, in this place, to look at the reverse side of this celebrated argument. Even if we do not seek to measure utility, we can still hold (if we choose) to the Assumption of Integrated Wants; and we can use it (by methods which will be explained in the next section) as a means of measuring, not Utility, but Real Income. If the cardinalists have gone too far in one direction, contending that it is possible to have an unambiguous measure of utility itself, ordinalists have often gone too far in the other, contending that we must limit ourselves to the mere comparison of a pair of positions, putting one above (or below) the other, without having any indication of the extent (or degree) of the difference. This is not so, as can be seen in general terms in the following way.

Let us suppose that our various sets of commodities are weakly ordered, so that the ordering can be represented by a set of indifference levels, or (sufficiently for the moment) by a set of two-dimensional indifference curves. Pareto's ordinal principle teaches us that the utility-indices which we can attach to these curves may be any set of numbers that rise as we go 'up' the curves. We may grant this, and still notice that there are various sets of numbers, which satisfy this condition, and which are in fact exhibited on the diagram. If the indifference curves intersect either axis, the intercepts along that axis will be one such set of numbers. Other sets can be found by drawing straight lines through the origin (or, indeed, any upward-sloping line—it need not even be a straight line), and noting the co-ordinates (either co-ordinate) of the points at which the line intersects the successive indifference curves. It has been a foundation of the ordinalist case that, of all the multitudinous measures that may be turned out by such a rule, no one is better than any other; there is a sense in which that is clearly correct. But it remains possible, even when that is granted, that there may be some of these measures which are more interesting and appropriate than others; I shall try to show that this is in fact the case. If we can grant the Integration assumption, we can find such measures; they will serve most of the purposes which the Old Welfare Economists sought to attain by the measurement of utility. But these measures (as is already apparent from what has just been said) are not reckoned in terms of utility; they are reckoned in terms of physical commodities, or combinations of commodities. They are not measures of Utility; they are measures of Real Income.

5. If we can grant the Integration assumption, this is the kind of thing we can do; but can we grant it, even provisionally? The obvious objection against it lies in the multiplicity of consumers. The wants, which are satisfied out of the Social Income, do not form a single system; there are as many systems of ordering as there are consuming units.

'Integrated Wants' (it may be argued) is nothing else but the Addibility of Utilities in another guise.

The connexion must, of course, be admitted; I think, nevertheless, that it is worth while to exhibit the critical assumption in this less familiar form. The multiplicity of consumers is not the only reason why we may be unwilling to admit the assumption of Integration. To assume that the individual consumer has a fully integrated scale of preferences is quite a big assumption. It is an assumption that economists have allowed to pass because of its undoubted convenience; but the more one thinks about it, the more dubious it becomes. Taken literally, to mean that the consumer is capable, at any time, of ordering all the alternatives that may be presented to him, it is obvious nonsense. Many of them will be alternatives about which he has not begun to think. And though, when an actual choice is presented to him, he must make some decision, it is by no means necessary that his successive choices (they must, in practice, be *successive* choices) should fit together into an integrated system. It is true that if his choices fail to fit together, we can always get out of the difficulty by saying that his tastes have changed. But that makes it altogether arbitrary to say that the change is a change from one *system* of wants to another.

This is a difficulty for the econometric theory of demand, as well as for the 'welfare' theory. In the econometric theory, as I have elsewhere maintained,[1] it can be overcome by postulating an Ideal Consumer, whose tastes will only change for identifiable reasons; it is the Ideal Consumer, not the actual consumer, who is assumed to have a given (and fully-formed) scale of preference, so that to him the Assumption of Integrated Wants does apply. It is not necessary to assume that the actual consumer (you or I, or the person one meets in the street) does have an integrated scale; we can allow for a considerable degree of randomness in *actual* preferences. All that is necessary, in the econometric theory, is to assume that the random element really is random; so that a population of actual consumers, if it is a sufficiently large population, will behave in the aggregate very much as a population of ideal consumers would do. This is a more credible hypothesis, and for econometric work it is sufficient.

It is not inevitable that the same interpretation, which fits the econometric theory, should be suitable for the application with which we are here concerned. But it can hardly be doubted, when we face up to the issue, that some corresponding construction is required here also. The crude identification of the 'preference machines', whose working we analyse so finely in Demand theory, with real human beings, is just wrong; it has been the source of a large part of our difficulties. The 'individuals',

[1] *R.D.T.*, pp. 16 ff.

whose want-structures we are here considering, are not actual consumers; they are ideal consumers, or (as it may be more appropriate to put it in the present application) *representative* consumers. To assume that the representative consumer has an integrated want-structure is a tolerable assumption; to apply the same assumption to actual consumers is, when we think it out, not tolerable at all.

A major consequence of this reorientation is that the old trouble about Addibility loses a good deal of its force. The Classical Utility theory, which assumes Integrated Wants for the whole economy, emerges as the theory which is appropriate, so long as we are prepared to work with representative consumers, who stand for the whole body of consumers. Formally speaking, we then neglect both differences in wants and differences in incomes, and suppose that the whole supply of each commodity is divided among a large number of representative consumers, each of them being (for all that we take into account) identical with every other. The consumers are identical and they get equal shares. For purposes where distribution is not important, this is a perfectly sensible and useful construction. It is perfectly proper, in appropriate places, to define a rise in real income to mean that the representative consumer is better off.

Obviously, however, it will not do for all purposes. When we are not satisfied with it, we must go farther. But it is senseless to go to the other extreme, to a population in which every individual has his own idiosyncracies; that is an assumption which we are entirely unable to manage, and it is not necessary. All that is necessary is a half-way house. We may think of our whole population as divided into sub-groups, with a representative individual in each sub-group; this is an assumption that can be dealt with by a modest extension of the classical method, and it gives us all that we can seriously want. For whatever may seem to be the case from the course of our arguments, the important conclusions of economics are not concerned with individuals; they are concerned with society and with the classes of society. With these we can deal on the lines I have been describing.[1]

To break up the total population into sub-groups is the same thing as to abandon the assumption of Integrated Wants for the whole economy; instead of assuming that all the wants can be integrated into a single system, we have a number of separate systems. Now I think that I shall be able to show that this is also the important thing that happens when we

[1] On this interpretation (it may be noticed) the question of population changes, which has worried some critics of my 1940 article (Kuznets, op. cit. pp. 2–3; J. de V. Graaf, *Theoretical Welfare Economics*, p. 160), is easily disposed of. There is no difficulty in changing population with constant tastes if the numbers in the various sub-groups change proportionately.

abandon the Integration assumption for a single individual.[1] Thus the procedure we have set before ourselves, of beginning with the classical (integrated) theory, and then modifying it somewhat, is doubly justified. We can deal with distribution, and with some disintegration of wants, at one blow.

6. *Revealed wants.* The second assumption of classical theory I am calling the Assumption of Revealed Wants. There is, of course, in this title an acknowledgement to the Revealed Preference of Samuelson; but I am making a slight change in his wording, to mark a slight change in meaning. He was concerned with the deduction from observed market behaviour, of the system of wants which is assumed to motivate it; my approach is less behaviouristic. I assume the existence of wants, independently of the market; whether these wants are 'revealed' on the market is not a question which (in general) I want to prejudge. Instead, I propose to mark off a portion of theory in which I do assume that wants are revealed on the market; but it is a provisional assumption, which we may seek to modify (at least in some respects) later on.

The precise significance of this second 'classical' assumption will become clearer if we examine some of the things which it obliges us to leave out of account. It is evident, in the first place, that wants cannot be revealed upon a market unless there is a market; a marketless economy, such as that of Robinson Crusoe or of a self-sufficient monastery, may have a Real Income, but it cannot be measured by the methods of classical theory. Even in more normal cases, there will be some commodities, which we shall want to include in the Social Income, but which have no market, so that the corresponding wants cannot be revealed in market demand in the way the assumption requires. Goods consumed by their own producer, without contact with the market, and public services provided by the State, are the main examples of this phenomenon; from the Real Income which is measured by classical theory they must be left out. We can only include them when we can find ways of stepping outside the classical model.

Even with respect to those goods that are sold upon a market, there are several ways in which we may doubt whether the market bids do properly reflect the wants which the goods are to serve. For one thing, the market may not be *free*; a rationed market, for instance, must be differently treated from a market that is free in the ordinary sense. Again, we should not be afraid to admit that there may be a failure of 'revelation' due to consumer irrationality, or lack of information; there is no reason why we should

[1] This is one of the ideas which I owe to Professor M. Morishima's stay in Oxford. See his 'Stability of Multiple Exchange', *Review of Economic Studies*, xxiv. 3. The point is elaborated on p. 156 below.

rule out the possibility that satisfactions may be improved by more instructed buying. It is, after all, the case that people do earn their living by providing such instruction; to treat the instruction itself as a commodity contributing to the social product in its own right, may be unavoidable, but is a clumsy way of proceeding. It does seem to be a better arrangement at this point to mark a distinction, which is to be deliberately neglected in the 'classical' theory, but which is left as one of the things which may be considered when we widen out. In any case it will serve as an introduction to the points which come next on my list.

When a consumer knows that he is ignorant, he may pay for instruction; but he may also pay to have decisions made for him. Doctors and lawyers and architects and stockbrokers may be paid to take certain sorts of economic decisions for their clients; these instances serve to remind us that the people who make choices are not necessarily the same as those whose wants are satisfied, to whatever extent, by the choices that are made. Even in the most perfectly individualistic economy, the distinction between the 'consumers' who choose, and the 'consumers' who enjoy, does not disappear altogether. In any economy that is not perfectly individualistic (that is, in any real economy) there are other forms of the distinction which are still more important. Every kind of voluntary association provides an example; and the two basic permanent associations, the family and the State, are of course the most important examples of all. In all these cases there is a question how far the wants that are 'revealed' by the choosers, do in fact coincide with the ultimate wants of the people for whom the choice is being made.

We need these distinctions for clarity of thinking; but we are still on ground that looks most intractable to economic analysis. In the end, we can hardly hope to do more than to find some polite way of evading these difficulties; yet, if they are indeed over the edge, they are nearly on the edge of the matters with which we do have to deal. And they lead up to an issue which we cannot shirk.

The investment goods, which we shall certainly want to include in some way or other as a part of the social income, are themselves (so far as they are acquired on the market) the prime example of commodities acquired *on behalf of* other people. They are the clearest and most important case where a distinction between choice-making and want-satisfaction is essential. It is indeed just because this is a case where the distinction forces itself upon us, so that we cannot avoid it, that the inclusion of investment goods in a utility-measured income has been felt to be paradoxical. Investment goods which are purchased by the ultimate consumer for his own satisfaction, whether the satisfaction be direct (as in the case of a gramophone) or indirect (as in the case of a spade to be used in the

vegetable garden) do not cause trouble; we are content to treat them as if they were consumption goods. We do this in spite of the fact that some of the utilities they will yield are future utilities, running outside the period under consideration; we do it because we are content to regard the wants that are satisfied by such commodities as directly revealed. Where difficulty arises is where the saver entrusts his savings to someone else to make investment for him. The distinction between chooser and enjoyer is then so marked that we are unable to overlook it.

In classical theory, as I have insisted, we keep to the Assumption of Revealed Wants and therefore rule out *all* these complications. With an eye on the last point only, it may then be said that the thing we are measuring is Consumption, not Income. I would, however, prefer to say that we are measuring Income, but are measuring it under restrictive assumptions, so that the problem of saving and investment (along with other complications) does not, at the Classical stage, arise. For if we cut it out altogether, we should be pushing it off to be dealt with in some quite different way than by present methods. I would prefer to leave it with a place where it does belong in the present analysis; though the opportunity which we thereby leave open is one that we shall hardly be able to explore within the limits of this paper.

III. The Classical Theory

7. It is easy, once the Classical Assumptions are granted, to proceed to the familiar conditions under which an index-number comparison will tell us that one position of the consumer is better than another, or yields a higher real income than the other. These conditions[1] are implied in the theory which follows, but I shall refrain from setting them out in the conventional form, since I propose to be more ambitious. As explained above,[2] I am looking for a measure of gain, for something more than a test whether or not a gain exists. It is a consequence of ordinal utility that there is no single measure which will do for all purposes; we are not starting after a wild-goose chase after that single measure. It does, however, remain possible that we can find outstanding measures, which are more interesting than their possible rivals. Such measures I now believe can be found.

We are comparing two positions (of the representative consumer) which I shall call A and B. At A he is purchasing the set (q_1) of quantities of commodities at the set (p_1) of prices; at B (q_2) at (p_2). Quantities and prices being different, there is in general no way of making a direct comparison between the two positions. We can only make an indirect comparison, by setting up an 'intermediate' position α, that is comparable in one way with A and in another way with B. α is comparable with A if it is

[1] See, for instance, V.S.I., pp. 108–10.

[2] p. 130.

indifferent with A; but then (since transitivity is part of the Integration assumption) it cannot, in general, be indifferent with B. α may nevertheless be comparable with B in another manner. We may, as is well known, be content to find an α which is clearly higher (or lower) on the scale of preference; but this, though it is sufficient for a test of gain, does not suffice to give a numerical comparison. For that, α must be comparable with B numerically. There are two basic ways in which an α which is numerically comparable with B can be selected.

These correspond to the two basic cases in which we can treat a basket of goods if it were a single commodity. On the one hand, if the quantities of all the goods in the basket are changed in the same proportion, we can say that the basket as a whole has changed in that proportion. A basket whose 'product-mix' remains unchanged is directly measurable in some appropriate unit. On the other hand, if the prices of all the goods in the basket remain unchanged (or change in the same proportion) the composite basket can again be treated as if it were a single commodity. These are the two basic principles of measurement which we shall use in what follows.

The existence of these two principles of measurement (or methods of standardization) imposes upon the ensuing theory the same dualism as I have shown elsewhere to run through Demand Theory generally. There is, indeed, a close correspondence between the method of measurement which reduces to proportional quantities, and the demand theory which is based on quantities—what in my book[1] I called the Marginal Valuation theory, or q-theory. There is a similar correspondence between the other method of measurement and the demand theory that proceeds from prices to quantities (the p-theory). I shall accordingly take over the terms which I used in that other place, and shall call the two measures the q-measure and the p-measure respectively. I shall begin by setting out the two theories quite independently of one another, and (for reasons which will become clear as we go on) I shall in this case take the q-theory first.

8. It is, I think, more or less inevitable, when we are analysing the wants of a representative consumer, that we should take the commodities consumed to be finely divisible. If, among 100 million consumers, there was one purchaser of a pet okapi, one hundred-millionth part of an okapi should enter into the representative consumer's budget. We shall seek to disembarass ourselves of this inconvenience, to some extent, as we go on; for the present, however, divisibility must be assumed. Let us accordingly take one mth part of the quantity of each commodity that is consumed in position A, and combine them together to form a unit of a composite commodity (an A-bundle). The A consumption (q_1) can then be re-

[1] *R.D.T.*, chs. 9, 16.

presented as m A-bundles. B consumption can be similarly reduced to m B-bundles. This makes it possible to proceed to an indifference diagram, essentially of the familiar type, in which A- and B-bundles appear as the two commodities.

In Fig. 1, A-bundles and B-bundles are measured on two axes, and the *positions* A and B are represented by the points A and B. (There is some

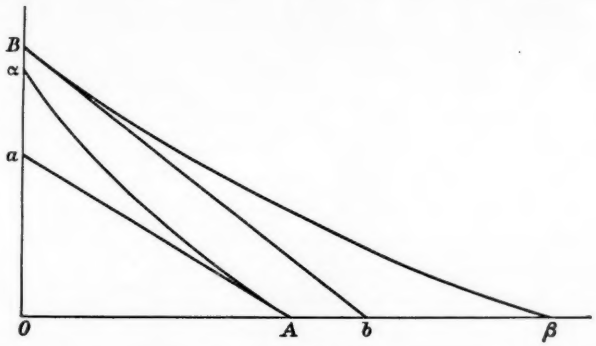


FIG. 1

slight convenience in making the distances OA and OB geometrically equal; since the units in which A- and B-bundles are measured are entirely arbitrary, there is no reason why we should not do so.) As in the elementary application of the diagram, a point (x, y), not on the axes, represents the combination of x A-bundles with y B-bundles. Any collection of commodities which is capable of being expressed as a combination of A-bundles with B-bundles is accordingly representable on the diagram. These, of course, form no more than a small part of the set of collections from which a choice might be made; if we desired to represent a collection which was not expressible in this manner we should have to introduce a third dimension. It does, however, turn out that all collections which are relevant for q-measurement are capable of being represented on the two-dimensional diagram thus defined.[1]

Let Oa be the number of B-bundles which has the same value, at A-prices, as OA A-bundles. Then, since the ratio OB/Oa is the ratio of two numbers of B-bundles, which will be the same at whatever set of prices commodities are valued, it can be expressed as the ratio between the value of B-quantities at A-prices and the value of Oa quantities at A-prices, which is the same as the value of A-quantities at A-prices. OB/Oa

[1] If there are no sorts of commodities in the B-bundle which are not in the A-bundle, and vice versa, there will be some collections of positive quantities of commodities which will be representable as *differences* between so many A-bundles and B-bundles. It may accordingly be proper to think of the indifference curves and price-lines as extending a little way beyond the A- and B-axes.

is accordingly equal to the Laspeyre quantity-index $(p_1 \cdot q_2)/(p_1 \cdot q_1)$. Further, since Oa is the number of B-bundles which the consumer could have acquired, if he had had his A-spending-power and could spend it at A-prices, the straight line Aa can be regarded as a price-line,[1] indicating those alternatives (representable on the diagram) which are open to the consumer when he is in his A-position. Out of these alternatives, and the many other alternatives (not shown) that are open to him, he chooses the point A; since (as assumed) he reveals his wants in that choice, there can be no point on the line Aa which is on a higher indifference level than the point A actually chosen. Thus the *indifference curve* between A- and B-bundles, which passes through A, cannot cross the line Aa; we will take it that they touch at A, just as any well-behaved indifference curve touches its price-line in ordinary Paretian theory.[2]

Let us call this indifference curve $A\alpha$, α being the point where it intersects the B-axis. As for its shape, I have drawn it convex to the origin, in the usual manner; this convexity can be demonstrated, in the usual way, if we are prepared to grant that each point along the curve represents a collection that could be chosen at some set of prices.[3] It is, however, worth observing that we are not obliged to make this additional assumption. The shape of the curve between A and α does not really matter for our present purposes; so we are not obliged to assume that the other points on the curve could be chosen points, nor even that α itself could be a chosen point. Since the collections that are represented by these points must often be very odd collections, in which commodities are combined in very peculiar proportions, it is just as well that we can avoid doing this. What does matter is that a (that is, Oa B-bundles) is among the alternatives rejected at A; it is accordingly impossible that it should lie on a higher indifference curve than A. α, which represents a real set of quantities of goods[4] (which the consumer might be given, even if he would not buy it

[1] It is of course a section of the hyper-plane which represents the whole set of alternatives open in a space of n dimensions (n being the number of commodities). The whole of the present construction is based upon the observation that for purposes of comparing *two* positions we do not need the whole n-dimensional 'diagram', but merely the plane section of it which is determined by the origin and the two points A and B.

[2] If (see note on preceding page) the indifference curve and the price-line can cross the axis to its negative side, positions on both sides of A are rejected in favour of A; then, granted that the indifference curve is a smooth curve, there must be tangency. Otherwise (and it is not difficult to spell out that this is correct) it is possible that the curve and the line may meet at A at an angle; but it remains true that the indifference curve lies wholly outside the price-line, and that (as we shall see) is all that matters.

[3] For this implies that at each point between A and α the curve lies outside its tangent, just as we have shown that it lies outside its tangent at the point A. (There is now no question that the curve must lie outside its tangent *on both sides*.) See also *R.D.T.*, ch. 19.

[4] It is, however, not to be excluded that the indifference curve through A might fail to intersect the B-axis, as would be the case if A contained an irreplaceable 'necessary' that was not included in the B-bundle. Even so, the rules which follow continue to hold, though α 'goes to infinity'.

of his own volition), does lie on the same indifference curve as A, and must therefore tend to lie outside a. The important thing is that $O\alpha$ is greater than Oa (save in the special case where the two bundles of goods are perfect substitutes); this is independent of the shape of the indifference curve between A and α.

9. We may now proceed to identify the position α, as just defined on our diagram, with the 'intermediate position' for which, at the beginning of this section, we decided to look. α is comparable with A, because it is indifferent with A; it is comparable with B, because it is a collection of commodities that is combined in B-proportions. A utility measure of the change in real income from A to B is accordingly that which is expressed on Fig. 1 by $OB/O\alpha$. Since $O\alpha > Oa$, we learn at once that this is *less* than the Laspeyre index which we have identified as OB/Oa.

Now, before going further, let us see what happens if A and B change places, so that instead of measuring from A towards B, we measure from B towards A. It is evident that the whole construction can be repeated on this basis (as indeed, I have shown it repeated on the diagram). Here we proceed to select an intermediate position β, which is indifferent with B, but comparable with A (because it is measured in terms of A-bundles). We can draw a price-line Bb, which (in the same sense) 'touches' the indifference curve $B\beta$. Ob is necessarily less than $O\beta$ (unless the bundles are perfect substitutes). The utility measure $O\beta/OA$ (writing it, for convenience of comparison, that way up) will now tend to be greater than the Paasche index (as it now becomes) Ob/OA.

That there are two price-weighted indices, according as we work from A towards B, or from B towards A, is very familiar. What is less familiar, though it is made quite clear from our diagram, is that there are two utility measures also. The same change (from one indifference level to another) is measured by $OB/O\alpha$ if we work in terms of B-bundles, and by $O\beta/OA$ if we work in terms of A-bundles. There is no single measure of real income. Every measure is infected by relativity; every measure depends upon the point of view from which the measure is taken.

In spite of this, the utility measures (as defined) do have one great theoretical advantage over the price-indices, and indeed over any other measure of real income or real product which we might invent. So long, at least, as we can grant the classical assumptions, there is a necessary *coherence* between the utility measures. On the classical assumptions, the two indifference curves $A\alpha$ and $B\beta$ belong to the same want-system; and it is impossible that two indifference curves, which belong to the same (integrated) want-system, should intersect one another. Thus β must lie on the same side of A as B does of α; our two ratios are either both of them greater than 1 or both less than 1. In spite of the fact that we have two

measures, so that the *size* of the change may look different according as we adopt the one measure or the other, each will show the same direction of change. If one says up, the other says up; if one down, the other down.

We cannot, of course, hope to estimate the utility measures directly; though the more precise formulation of the measures which has just been given may perhaps help in the search for indirect ways in which we might get some notion of their magnitudes. The obvious use of the analysis is to give us a means of evaluating the significance of the price-indices. Though the reformulation of the rules about the price-indices which it permits does not add much to what is known in other ways, we shall need it later on, and must therefore set it down.

Let **L** and **P** be the Laspeyre and Paasche price-indices; let p be the utility index $OB/O\alpha$, and l be the utility index $O\beta/OA$.[1] We then have $\mathbf{L} \geqslant p$, $l \geqslant \mathbf{P}$. If we could assume that $l = p$, it would follow that $\mathbf{L} \geqslant \mathbf{P}$. But we cannot assume that this equality is true in general. All that we know is that l and p lie on the same side of unity. Thus if $\mathbf{L} < 1$, $p < 1$; therefore $l < 1$, and $\mathbf{P} < 1$. Also if $\mathbf{P} > 1$, $p > 1$; therefore $l > 1$, $\mathbf{L} > 1$. We can argue each sequence its own way round, but not the other.

There are therefore the following possible cases:

(1) If **L** and **P** are both greater than 1, it follows that l and p are greater than 1, so that there is a rise in real income.

(2) If **L** and **P** are both less than 1, l and p are both less than 1, and there is a fall in real income.

(3) If $\mathbf{L} > 1$, $\mathbf{P} < 1$, l and p may both be greater or both less than 1; nothing is shown whether there is a gain or a loss.

(4) This is, finally, the 'impossible' case—that $\mathbf{L} < 1$, $\mathbf{P} > 1$. There is, of course, no reason why this case should not occur, on occasion, in practice; but if it does, what is shown is that the classical assumptions will not do. Behaviour of this kind is incapable of being interpreted as the 'revealing' of an unchanged integrated want-system by a representative consumer.[2]

[1] This notation is of course a pure convention; we could have labelled them the other way. But it turns out to be handier to do it this way. As a mnemonic, let l's and p's suggest *large* and *petty*, as well as Laspeyre and Paasche.

[2] It will, of course, be recognized that these rules are nothing more than a restatement of the familiar rules of Revealed Preference theory. They should, therefore, be completed by some discussion of the limiting cases when one or both of **L** and **P** are equal to 1—cases which may have some importance in practice, but which are especially interesting because of the role which they play in discriminating between Strong and Weak Ordering in that other application (*R.D.T.*, ch. 6).

(5) If **L** and **P** are both equal to 1, l and p must both be equal to 1; any other interpretation is inconsistent. (It is incidentally shown that the two sets of goods are perfect substitutes.)

(6) If $\mathbf{L} = 1$, $\mathbf{P} > 1$, it would follow that $l > 1$, $p \leqslant 1$; but this is inconsistent.

(7) $\mathbf{P} = 1$, $\mathbf{L} < 1$, is similarly inconsistent.

(8) If $\mathbf{L} = 1$, $\mathbf{P} < 1$, it follows from our rules that l and p are both either less than 1, or

10. All that has been said, so far, belongs to the q-theory. It is complete in itself, and the results which it gives are in accordance with those which economists have long been willing to accept, in some form or other. There is only one reason why we may want to look further.

Consider the case (common enough in practice) where the two price-weighted indices (**L** and **P**) give quite harmonious results. Each of them (let us say) registers a rise of 5 per cent. We can then deduce from the above argument that the Laspeyre utility index (if we could find it) must register a rise of at least 5 per cent.; and that the Paasche utility index (which must move in the same direction) must rise by something between 0 and 5 per cent. If we were also prepared to admit that the two utility indices (though not necessarily equal) could not diverge from one another *very much*, it would be easy to conclude that the 5 per cent. rise, shown by the statistics, was 'pretty representative' of the real rise that had occurred. I suppose that it is by faith in this kind of proposition that economists do justify to themselves the use they make of index-numbers. If it checks up both ways, it must be right!

It must, however, be observed that the conclusion only follows if the indifference curves ($A\alpha$ and $B\beta$) are nearly linear; but it by no means follows from parallelism of the price-lines that the indifference curves are straight lines. There is, it is true, a limit to the extent to which they can curve; but they can curve quite enough to make nonsense of our measure. It is entirely possible, on the figures given, that l might show a big rise (say 20 or 30 per cent.) while p showed scarcely any rise at all. If this were really the case, we could state that real income had risen, but we should be quite baffled on the amount of the rise; neither of the figures just quoted would have much significance.

Now there is some reason to suppose that the case just isolated is by no means a freak case; it may indeed be fairly general. It is by no means impossible that the proportions in which commodities are combined in the consumer's budget depend quite largely on the level of real income which he attains; they are more sensitive to changes in the level of real income than they are (excepting among groups of close substitutes) to changes in relative prices. If there is anything in this (and one's impression is that

equal to 1. This is the most interesting case. For it may be questioned whether the interpretation that $l = p = 1$ is really open. If A, B, are on the same indifference level, and the indifference curve AB touches the price-line AB at A (since $\mathbf{L} = 1$), it must also touch it at B if it is to maintain the convexity property. Thus if the indifference curve is well behaved, and there is contact between it and the relevant price-line in both positions, we can conclude from $\mathbf{L} = 1$, and $l = p = 1$, that $\mathbf{P} = 1$. If $\mathbf{P} < 1$, this alternative is then ruled out; we can therefore conclude that l and p are less than 1. I do not, however, regard this argument as being a strong argument, since the assumptions on which it is based do not have to be made. Perhaps we might say that in this case l and p are 'probably' less than 1.

(9) If $\mathbf{P} = 1$, $\mathbf{L} > 1$, the analysis is of course exactly similar.

there is a good deal in it), the equi-proportional changes which we have been using as a standard of reference are a good long way away from the changes which the consumer, in ordinary market conditions, would spontaneously desire. If he is to be moved from an actual position on to a considerably higher indifference level by an equi-proportional expansion, it will have to be a big expansion; while an equi-proportional contraction (from an actual position) will cut his satisfactions very considerably, even if it is only a small cut.

The alternative method of measurement (the p-theory), to which I now turn, may be presented as a means of overcoming this difficulty. Instead of amalgamating a bundle of commodities into a single commodity by keeping quantities in fixed proportion, we amalgamate them by keeping them exchangeable for one another at fixed prices.

11. The p-theory can be put upon a diagram in the following way. (This diagram, the reader should be warned, is not—like the last—a mere adaptation of the ordinary indifference diagram; it is a kind of inversion of the indifference diagram. But there is a close correspondence between it and the indifference diagram which we have been using.)

We start, as before, with a position A, in which prices are (p_1), quantities consumed (q_1) and 'income' accordingly $(p_1.q_1)$. If income were to increase, while prices remained unchanged, the consumption of each commodity would change in a particular manner, tracing out its own income-consumption curve (or Engel curve). The successive positions taken up could then be *defined* by the corresponding levels of income. If we measure income along a line (the A-axis in Fig. 2), and suppose that prices remain at (p_1) while income moves along that line, the situations of the consumer at successive points are completely defined, and the positions reached can be compared with one another by considering the change in income. We may mark a position A (as before) as the first of the positions we seek to compare; it is determined, once the prices (p_1) are given, by the income shown as OA. Other points on the A-axis are to represent the positions taken up at (p_1) prices with the incomes shown.

At B, prices are (p_2); so B cannot be placed on the A-axis. We draw a new B-axis for it, along which incomes, spent at prices (p_2) define a second set of positions in a similar manner.

Though it is not absolutely necessary for most of what follows, it will make for clarity if we give a meaning to positions which are not on either axis. These should be positions which are taken up when prices are in some sense intermediate between (p_1) and (p_2). The point $(x, 0)$ on the horizontal axis represents the collection of goods purchased when income is x and prices (p_1); the point $(0, y)$ that when income is y and prices (p_2). It would seem by analogy that (x, y) should represent the goods which

would be purchased if the consumer had an income x, spendable at (p_1) prices, *and* an income y, spendable at (p_2) prices; this is nearly, but not quite what we want. For we want to compare conditions in which the consumer is spending his income at given, uniform, prices; and this means that the choice whether to pay for a particular purchase out of one 'purse' or the other is not a choice which should be left open. We can close it if we impose the additional condition that equal proportions of the various

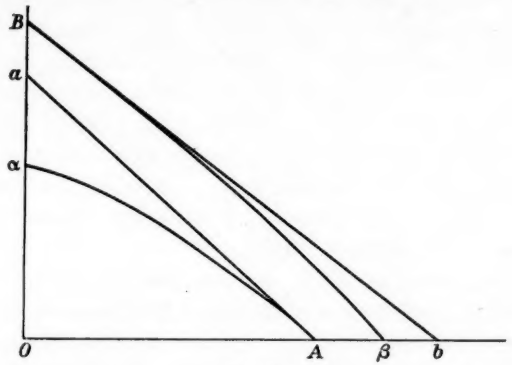


FIG. 2

commodities purchased are to be paid for out of the two 'purses'. If the ratio is kept the same for all commodities, the quantities consumed will be the same as if income had been $x+y$, and the prices of the various commodities had been 'similarly intermediate' between their p_1 and p_2 prices —that is, they had divided the gap between p_1 and p_2 prices in the same ratio.

This being understood, we begin by looking for an expression for the price-weighted indices (as in the corresponding stage of the q-theory). Let Oa be the income, spent at (p_2) prices, which would just suffice to purchase the actual set of commodities purchased at A. Thus Oa is $(p_2.q_1)$; OB/Oa is $(p_2.q_2)/(p_2.q_1)$, which is the *Paasche* price-weighted index **P**. (It is important to notice the criss-crossing, which is a natural result of the change from working in terms of quantities to working in terms of prices; OB/Oa was the Laspeyre index in the other theory.) Now if the consumer were actually at a, with income Oa and prices (p_2), he would (in general) not purchase the A collection (q_1), though that collection is available to him for purchase; other alternatives are open to him which were not available to him at A, so that he can move to something else which he prefers. Thus a, which (it must be remembered) represents the actual set of goods which would be purchased if prices were (p_2) and income Oa, will (in general) be on a higher indifference level than A. If we define

$O\alpha$ as the income, spendable at (p_2), which makes it possible to reach the same indifference level as was reached at A, α must tend to lie inside a, as drawn.

We may now (as in Fig. 1) draw a straight line joining A to a, and an 'indifference curve' joining A to α. What are the meanings of this line and this curve?

Since Oa is the cost of (q_1) quantities at (p_2) prices, the line Aa will exhibit that set of incomes which will enable (q_1) quantities to go on being purchasable, while prices change over, by steps, from (p_1) to (p_2). This is the same thing as saying that it exhibits the incomes which would be payable if income were adjusted, for each change of prices, by a cost-of-living index based on A. It must accordingly be insisted that Aa does not represent a set of simultaneously available alternatives, like the corresponding line in the other diagram. Instead of calling it a quantity-line (to match the price-line of the q-theory), it will help us to be clear about its character if we call it a *bonus line*.

Thus at each point on the bonus line, the A quantities (q_1) remain available. These quantities are chosen at A, but at the other points on the line they need not be chosen. The quantities actually chosen (which, I repeat, are those that are to be taken to be marked by the points on the diagram) cannot therefore, at any point on the bonus line, lie on a lower indifference level than the point A. The indifference curve, $A\alpha$, if we take it to join those incomes which permit of the attainment of the same level of satisfactions as was reached at A, will therefore tend, except at A, to lie below the bonus line. On substantially the same grounds as in the q-theory, it may therefore be taken to touch the bonus line at A.[1]

It then follows that the shape of the indifference curve must be as I have drawn it in Fig. 2. It is indeed possible that the indifference curve may coincide with the bonus line over a stretch, as will happen when the change in prices (with income bonus) leaves consumption unaffected. Tangency must be interpreted to include this possibility. Nevertheless, apart from the possibility of such linear stretches, the indifference curve must be concave to the origin *throughout*. The proof of this concavity is indeed much more conclusive than that of the convexity of the ordinary (q) indifference curve. For now, assuming that prices can change continuously, every point on the diagram is a possible point—one that may actually be taken up in some possible circumstances. There must be an in-

[1] If the same sorts of goods are purchased at A as at B, there can be no question that the series of price-sets is capable of being extended beyond the A-axis into the negative quadrant, so that the indifference curve through A lies below the A bonus line on both sides. If there are goods in B which are not in A, we cannot assert tangency at A; the rest of the construction (including the curvature of the indifference curve) does, however, remain unaffected.

difference curve, and a bonus line, through every point; unless they coincide at that point, every other point on the indifference curve must lie within the bonus line. Whence the conclusion follows.[1]

That the p-indifference curve (or indirect indifference curve, as some may prefer to call it)[2] should bend the opposite way from the familiar q-curve is perhaps a little disconcerting. But it is a property that belongs to the nature of the case; as far as I can see it is quite unavoidable.

12. Fig. 2 can of course be completed by drawing bonus line and indifference curve based on B. When that has been done, the rules about the relations between price-indices and utility-indices can be read off at once, just as we read them off from the q-diagram.

Defining the new $OB/O\alpha$ and $O\beta/OA$ as new utility-indices, we must in this case take $OB/O\alpha$ as the Laspeyre index (because of the criss-crossing). Call it $\boldsymbol{\lambda}$. Then $\boldsymbol{\lambda} \geqslant \mathbf{P}$ (since α now lies inside a); and if $\boldsymbol{\pi}$ is the Paasche utility index, $\mathbf{L} \geqslant \boldsymbol{\pi}$ (since β now lies inside b). Thus the relations of $\boldsymbol{\lambda}$ and $\boldsymbol{\pi}$ to $\mathbf{L}$ and $\mathbf{P}$ are the same as those of l and p. Since $\boldsymbol{\lambda}$ and $\boldsymbol{\pi}$ must be greater or less than unity together (so long as we maintain the integration assumption), exactly the same rules, and the same classification into cases, will hold here as in the q-theory.

This is, of course, as it should be. For what we are trying to do, by either method, is to reduce the movement from A to B (actual A to actual B) to a movement from one indifference level to another. l and p, $\boldsymbol{\lambda}$ and $\boldsymbol{\pi}$, are all of them measures of the relation between these indifference levels. If there is an integrated want-system, they must all of them cohere with one another, rising or falling together. Subject to this general harmony, it does, however, remain possible that one pair may move in a less eccentric manner than the other. I have already said something about that, but it deserves a fuller investigation, to which I now turn.

IV. Relations between the Utility Indices

13. I begin by observing that there is an Additional Inequality between the Indices, which can be derived in the following manner.

$\boldsymbol{\pi}$ ($O\beta/OA$ on Fig. 2) is the proportional increase in income, spendable at A-prices, which would have to be given to the consumer, if he is to reach, by that change alone, a position indifferent to that he attains at B.

[1] Concavity of the p-indifference curve is an expression of the substitution Theorem (*R.D.T.*, chs. 7, 12); convexity of the q-indifference curve expresses the principle of Diminishing Marginal Valuation. As shown in *R.D.T.* (ch. 9), the latter principle is subject to more exception than the former.

[2] The utility function, in which utility is made to depend upon income and prices, instead of depending on quantities directly, has been called by Houthakker the 'indirect utility function' (H. S. Houthakker, 'Compensated Changes in Quantities and Qualities Consumed', *Review of Economic Studies*, xix. 157). My p-indifference curves are its contour lines.

l ($O\beta/OA$ on Fig. 1) is the proportional increase in A-consumption, uniform over all commodities, which would be required, if he were to reach in that way a position indifferent with B. This latter can be reckoned as a proportional increase of income at A-prices, with the imposed condition that the income is to be spent by increasing the consumption of all commodities in the same proportion. That is to say, in the one case the consumer is allowed to spend the increment of income freely, while in the other it is specified that he is to spend it in a particular way (which we may allow ourselves to observe will often be a most uncomfortable way). In general, when income rises and prices remain constant, the consumer will not desire to increase his consumption of all commodities in the same proportion; if he is made to do so, and is yet to reach a position indifferent with B, his income will have to be increased further than it would have to be increased if he were allowed a free choice. It therefore follows that $l \geqslant \boldsymbol{\pi}$; and (by the same reasoning put the other way round) that $\boldsymbol{\lambda} \geqslant p$.

How much help do we get from this Additional Inequality? Generally speaking, it must be granted, not very much. If we go back to the case which we previously considered, when **L** and **P** are nearly equal (the case which, as stated, seems to be common in practice), we have already learned that $\boldsymbol{\lambda}$ and l are likely to be greater than the common value of **L** and **P**, while $\boldsymbol{\pi}$ and p are likely to be smaller than that common value. In that case, then, the Additional Inequality will be automatically satisfied. It tells us nothing more than we knew before.

In some other cases it is a little more useful. It follows quite generally from the Additional Inequality that $l + \boldsymbol{\lambda} \geqslant p + \boldsymbol{\pi}$. If we write d and $\boldsymbol{\delta}$ for the two *discrepancies* $l - p$ and $\boldsymbol{\lambda} - \boldsymbol{\pi}$, the mean of these two discrepancies must be non-negative. It is possible that this mean may be zero (as will happen, for instance, when A and B are on the same indifference level, so that both discrepancies vanish). If, however, there is a substantial difference (both in utility level, and in prices and quantities) between the two positions that are being compared, it does look as if we may expect the mean discrepancy to be fairly substantial. For what the mean discrepancy measures is the inconvenience of being made to adjust to a change in market opportunity in an inappropriate way; and that inconvenience may be expected to be rather considerable.

If this is granted, we may classify as follows:

(1) If d and $\boldsymbol{\delta}$ do not differ much from their mean, and therefore from one another, the two pairs of utility-measures will be symmetrically situated with respect to **L** and **P**. Both of them will run outside the **LP** interval if **L** and **P** are close together, but both may fall within if **L** and **P** are relatively far apart.

(2) If $\boldsymbol{\delta}$ is small (or perhaps negative), d will be large and positive. The

p-measures may then fall within the **LP** interval, while the q-measures run outside.

(3) If d is small (or perhaps negative), $\boldsymbol{\delta}$ will be large and positive; the q-utility measures will then fall within, while the p-measures run outside.

These conditions could be more precisely stated, but no advantage seems to be derivable from further elaboration. As far as the formal theory is concerned, the symmetry between the p- and the q-measures seems to be complete.

14. Let us, however, make an attempt to inquire more closely into the conditions in which these classes of cases can arise. There are limiting cases of (2) and (3) which can be analysed quite fully; by considering these cases we can get some idea of the way in which more general cases are to be interpreted.

(2a) Suppose that, as between the two actual positions compared there is a change in quantities consumed, but no change in any prices. Then $\mathbf{L} = \mathbf{P}$ (for the two index-numbers now have the same weights). By definition, $\boldsymbol{\lambda}$ and $\boldsymbol{\pi}$ are equal to the common value of **L** and **P**. $\boldsymbol{\delta}$ is zero, but d may still be substantial. l may be substantially greater than the common value of **L** and **P**, p substantially less. The excess of l (and the deficiency of p) will obviously correspond to the inconvenience of a proportional change in consumption, instead of the change in quantities consumed that has been freely chosen.

(3a) Suppose, on the other hand, that there is a change in prices between A and B, but that quantities consumed do in fact change proportionately. Here again we have $\mathbf{L} = \mathbf{P}$ (for both express the proportional change in consumption); but here it is l and p which are (by definition) equal to the common value. $\mathbf{d}$ is zero, but $\boldsymbol{\delta}$ may be substantial. $\boldsymbol{\lambda}$ and $\boldsymbol{\pi}$ then move eccentrically. This is correct, for $\boldsymbol{\pi}$ is the proportional addition to income, at A-prices, which would move the consumer on to the same indifference level as he reaches at B; this, for the reason stated, will ordinarily be less than the proportional change in consumption which has occurred.

It would seem safe, from a consideration of these limiting cases, to conclude that **L** and **P** will give a better representation of the p-utility indices when relative prices change less than relative quantities; while the q-utility indices will be better represented when the change in relative prices is the greater. If prices and quantities are both moving rather freely, it may still be true that **L** and **P** are near together (since, as is well known, they may be brought together by mere lack of correlation between price and quantity movements). Both pairs of utility-indices may then diverge, and there will be no reason for preferring the one pair to the other. If, however, there is a greater 'harmony' in the movement of prices

than in the movement of quantities, that is a reason for preferring to work in terms of p-indices; and (of course) vice versa.

One would think, stepping at this point quite outside the formal demand theory we have hitherto been using, that there is some reason to expect that there will be a bias in this matter; and that it will be a bias on the price side. If our two *positions*, A and B, are positions of the same economy, but are far enough apart in time to give opportunity for 'long period' adjustments in supply, relative price changes should be kept, by these supply adjustments, fairly small; even when the economy is growing, by capital accumulation and technical progress, this should still be true. If they are positions of different economies at the same time, international trade makes for some degree of price-harmony. I am unable to see that there are any similar forces that make for quantity-harmony. It is characteristic of economic growth that consumption expands along Engel curves, which rarely show a unity elasticity. The budgets of the representative consumers of different countries differ profoundly, quite apart from differences in wealth, for climatic reasons alone. It may indeed be maintained that for these reasons there is at bottom something unnatural about q-comparisons; p-comparisons do not merely sound better sense, they are better sense, in the kind of world in which we live.

V. Relaxing the Integration Assumption

15. We now begin our attempt to relax the classical assumptions. The first to be considered is the Integration Assumption. I shall begin by taking that, not in its most general form, but in the special form of the Assumption of the Representative Consumer, to which it largely corresponds. This assumption (once we are conscious of it) is one of the most obvious limitations of the classical analysis; can we get rid of it?

What we have hitherto been doing is to frame our critical question in the following manner. If income at A, and income at B, had been equally divided among a number of identical consumers, each with an integrated want-system that was revealed by his market behaviour (identical on the average with actual market behaviour), how much would they (each of them) have gained by moving from the one situation to the other? That, as we have seen, is in principle an answerable question; but it may fairly be argued that it is not the question that we want to have answered. The incomes of different consumers are in fact different and their wants may be different; we are therefore, by this procedure, taking an economy of one kind (with unequal distribution) and transforming it into an economy of another kind (with equal distribution) in order to make the situations comparable. It is natural to ask whether we are unable to make a comparison which does not involve any such transformation.

This (as I now see it) is the root of the question which was being asked by the 'New Welfare Economists' of the late nineteen-thirties. They were indeed over-confident in their belief that they had found a means of direct comparison which will always work. But I still maintain that they did find a means of direct comparison which will often work—a means which enables us to go some way (though we shall go on disputing whether it is a great way) beyond the confines of classical analysis.

Here again it is essential to be clear what we are trying to do. As I insisted at an earlier point in this article,[1] it is not possible to allow for every sort of individual idiosyncrasy. All we can do is to admit the existence of different classes in the population, with a representative individual in each class. Let us say that there are N_1 representative consumers of type I, N_2 of type II, and so on. The number of types can be as many as we like, but (for the present) we retain the assumption of a fully integrated want-system for each of these typical consumers.

It is evidently possible, when we decide to group the population in this way, to take each class separately, and to apply the Classical analysis to that class, in isolation from the rest. Instead of asking 'what is the change in the Average Real Income of the Nation as a whole?', we can confine our attention to subsidiary questions, such as 'what is the change in the Average Real Income of coal-miners?' But there are occasions—indeed, there are many occasions—in which we do want to give a meaning to the change in the Real Income of the whole community; we cannot ultimately avoid the larger question. And it is, of course, true that the smaller question, when we look at it closely, reproduces, on a smaller scale, the same difficulties.

If we have knowledge, not only of total quantities consumed, but also of the distribution of consumption between classes, we are clearly at liberty to serve up our results in the form of a statement that the real income of class I has risen so much, that of class II has risen so much, and so on. We should, however, be able to say something about the change in real income of the community as a whole without requiring such knowledge, or (perhaps) without directly using such knowledge. We are still trying to give a meaning to the price-weighted index-numbers of consumption as a whole; only we want to avoid the introduction of assumptions about distribution that are patently false.

16. Once again we proceed by seeking equivalents. We interpose between A and B a position α which is cardinally comparable with B, and equivalent, in want-satisfying power, to A. As before, the cardinal comparison can be effected in either of our two manners, so that we still have a q-theory and a p-theory at our choice. The essential change, which

[1] p. 132 above.

differentiates our new construction from its predecessors, concerns the other leg, the equivalence by indifference.

It was (we can now see), the Great Discovery of the New Welfare Economics, that the notion of indifference is capable of being extended, with suitable precautions, from the behaviour of a single (or representative) individual to that of a not necessarily homogeneous group. Starting from a set of quantities (q_1) that are distributed in a given manner among such a group, we can define a series of other sets which are capable of being distributed, *without waste*, in such a way as to keep *each* individual on the same level as he reached initially. The qualification 'without waste' is important. If, for the actual set of commodities acquired at A, there is substituted, for each individual separately, another set which satisfies the indifference condition, it will in general be possible for some at least to improve their position by mutual exchanges, so that, after the exchanges, the indifference condition no longer holds. The totals of goods that have then been provided turn out to be more than sufficient to keep every individual on the same indifference level. A set which is *collectively indifferent* to (q_1) must be capable of being distributed so as to leave each individual on his initial indifference level, without leaving any opportunity for advantageous exchange. The indifferent positions are all of them optimum positions in this limited sense.

That collective indifference curves (or hyper-surfaces) in this sense can in general be constructed is made ocularly evident by that adaptation of the celebrated box diagram which we owe to Mr. Kaldor. It is sufficient to take the case of two persons and two commodities. If individual I is at position P, with respect to axes O_1X_1 and O_1Y_1, while II is at position P with respect to axes O_2X_2 and O_2Y_2, the superposition of the two P's (with axes reversed) as shown in Fig. 3, enables us to read off the total quantities at the disposal of the pair by considering the coordinates of the second origin (O_2) with respect to the I axes. It is at once apparent that if the indifference curves through P do not touch, the total quantities can be reduced (O_2 can be moved south-west), while each individual remains on the same indifference level. If we insist that the tangency condition is to be maintained throughout, we can move the II curve round on the I curve, keeping contact; the locus of O_2, with respect to the I axes, will then be the collective indifference curve. It is evident that it has the same shape as an ordinary indifference curve. And clearly we may extend the same method of compounding to any number of persons and any number of commodities.

If the quantities acquired at our A are being acquired on a market, with identical prices to different consumers (so that the Revelation Assumption holds), the tangency condition (or optimum condition of exchange) is

automatically satisfied at that position. We can accordingly draw collective indifference curves through A, with the optimum condition assumed to be satisfied all along the curve.

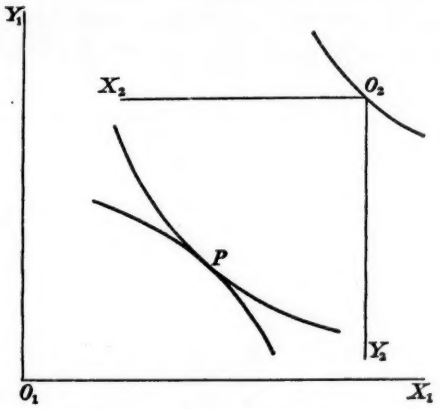


FIG. 3

17. All this being understood, let us go back to the q-theory. As in the classical version (Fig. 1), we can measure A- and B-bundles along the two axes. But we must now be clear that the bundles are put together in a 'macro'-manner; commodities are combined in the proportions in which they are consumed *in the economy as a whole.* Initial *total* consumption is represented by OA A-bundles. Oa is the number of B-bundles which have the same money value (at A prices) as OA A-bundles; OB/Oa is the Laspeyre price-weighted index, as before. $A\alpha$ is the *collective* indifference curve (between A- and B-bundles) that passes through A. In view of the way in which that curve has been built up, we may take it that it is convex to the axes (under similar restrictions as held in the classical case), and that it touches Aa at A. All this is identically the same as it was in Fig. 1; I have therefore thought it unnecessary to redraw the diagram.

The only way in which there may be a difference between the diagram, so interpreted, and that which we drew originally, concerns the relation between the two indifference curves $A\alpha$ and $B\beta$. In the classical version, $A\alpha$ and $B\beta$ were two indifference curves of the same consumer; given that he had an integrated want-system, it followed that the one curve must lie wholly within the other. Here (it is, of course, the Great Discovery of the Critics of the New Welfare Economics) there is no reason, in general, why intersections should be ruled out. It is not necessary that the utility measures, which result from the present construction, should *cohere*, as they were bound to cohere in the classical version. The collective

indifference curves are not parts of an integrated want-system; the proof of coherence, which was previously given, therefore falls to the ground.

This must be accepted; but we need not therefore admit defeat. We are doing no more than generalizing the classical theory, which remains valid as a special case of the present construction; what was true there cannot always be untrue here. We must clearly be prepared to insert additional

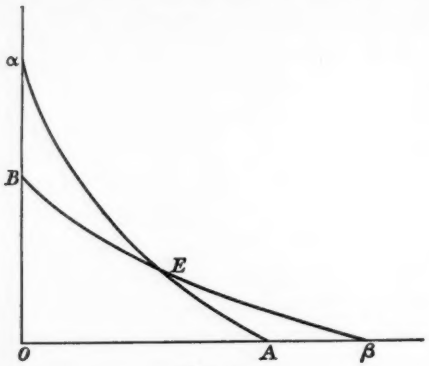


FIG. 4

qualifications as we generalize; it should, however, be possible to establish more precisely what those qualifications are.

To begin with, it is evident that we have already gained something by the concentration, on which we have insisted, on particular measures of the utility gain. Even if our two measures are in fact coherent, so that B lies outside α, and β lies outside A, we are clearly no longer entitled (once we lose the general proof of non-intersection) to assume that some other commodity-mix could not be found, measured along which the relation of the two indifference levels would be reversed. But, so long as we confine our attention to the relation between the two positions A and B, what might happen in quite other conditions may be judged irrelevant. If coherence between the A- and B-based utility measures could be established we should have all that it is fair to ask.

If B lies inside α while β is outside A, so that the utility measures **l** and **p** are not coherent, the collective indifference curves $A\alpha$ and $B\beta$ must intersect between the axes (Fig. 4). We can establish the conditions which are necessary for this to happen by considering the properties of a point of intersection E. E, it must be emphasized, is an actual set of quantities of commodities; since it lies on the curve $A\alpha$, it must be capable of being distributed so as to make every individual exactly as well off as he is at A; and since it lies on the curve $B\beta$, it must be capable of being distributed so as to make every individual exactly as well off as he is at B. But if A and

B do not lie on the same curve (in which case there is no problem), it will only be possible for E to have these properties if the E goods are differently distributed, according as E is thought of as lying on the one curve or the other. And since each E distribution is a wasteless distribution (in view of the optimum property of the collective curves), E goods can only be differently distributed if E incomes are differently distributed; the re-

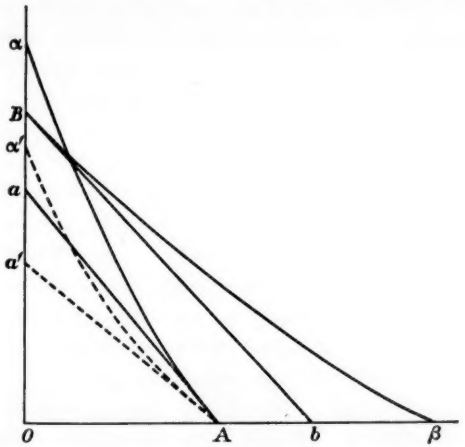


FIG. 5

distribution must be to the advantage of some individuals (or classes) and to the disadvantage of others. There is in fact no longer a single indifference curve passing through each point on the diagram; there is a 'fan' of indifference curves through each point corresponding to different distributions. Along any single curve distribution (in this sense) must be taken to be the same; thus it is not possible for the two curves to intersect unless distributions at A and at B are significantly different.

This, I think, is by now well understood; but it is possible, by our apparatus, to take the matter a little further. We know that if distribution is the same at A and at B, there can be no intersection. Accordingly, when there is a change in distribution, we may break up the whole change that is under consideration into two steps. In the first step, there is a change in distribution, but no change in quantities; at the second there is a change in quantities, but no change in distribution. (That there is no change in distribution needs to mean no more than that the real incomes of all classes move in the same direction.) Since the total quantities consumed are unaffected by the first step in this division, there is no movement, at that first step, away from the position A on the diagram. But since there is a change in distribution, the position of the indifference curve $A\alpha$ will, in general, be varied. Suppose that it moves to $A\alpha'$ (Fig. 5). Then,

since at the second step there is no change in distribution, $A\alpha'$ and $B\beta$ cannot intersect. Consequently, if $A\alpha$ and $B\beta$ do intersect, while $A\alpha'$ and $B\beta$ cannot intersect, there must not only be some movement from $A\alpha$ to $A\alpha'$; there must be a movement in a particular direction. The perverse case, in which the curves intersect, can only arise if there is a change in distribution which swings the indifference curve in a particular direction.

What that direction is, can be seen in the following manner. When the curve $A\alpha$ is swung downwards to $A\alpha'$, its tangent at A will also (not quite certainly, but most probably) be swung downwards, to a position such as that shown by Aa' on Fig. 5. What this signifies, in economic terms, is that the change in distribution, with total consumption of all commodities unchanged, will ordinarily require a change in prices. Let us call the quantity-index, of (q_2) to (q_1), which is weighted by these new prices, $\mathbf{L}_0$. Then if $Oa' < Oa$, $OB/Oa' > OB/Oa$, and $\mathbf{L}_0 > \mathbf{L}$. The change in prices, which results from the change in distribution, must accordingly move the quantity-index in the opposite direction to that in which it is 'normally' moved by the change in quantities; this is the same kind of distributional effect as makes for unstable equilibrium in the (Walrasian) theory of simple exchange, and it is not in the least surprising to find that it gives trouble in this context too.

18. I have worked out this analysis at length in terms of the q-theory, since that theory proceeds with ordinary indifference curves, instead of the inverted kind, which will be less familiar to the reader. Exactly the same principles could, however, have been expressed in p-terms, and it may well be that in its p-version the argument is more compelling. It seems unnecessary to write out the p-version at similar length; an outline will be sufficient.

A collective indifference curve, of the p-variety, will indicate the sum of the incomes, spendable at a given set of prices, which would enable each consumer to reach a position indifferent with that which he occupied in his initial position. Since the individual p-curve is constructed with the set of prices as an independent variable, the rule of compounding is simpler than that which applied to the q-curves. The individual p-curve is the locus of (x, y) when $x+y$ is the income which will admit of the attainment of a position indifferent with the initial position, when prices are defined by a parameter represented by y/x. The collective indifference curve is accordingly formed by adding the individual curves along each vector; the slope of the vector (y/x) determines the price-set, and the coordinates of the corresponding point on the collective curve are then found by summing $\sum x$ and $\sum y$ over all individuals. It is evident that the collective curve must have the same shape as the individual curves (being concave

to the origin, as in Fig. 2 above): and it can be shown that it will touch the bonus line in the same manner.[1] Thus the p-diagram, just like the q-diagram, can be reinterpreted in a collective sense: in neither case is there any change in the diagram, except that in both cases we lose the direct proof that the two indifference curves $A\alpha$ and $B\beta$ cannot intersect.

It is at once apparent that if the curves intersect, there must be a change in the distribution of income between the positions that are being compared. For the point of intersection (E) now represents a particular total of incomes spendable at given prices; if it is to be indifferent with A along $A\alpha$, and with B along $B\beta$, and they are not indifferent with each other, the two E's must be in some way different, and the only difference that can now exist is a difference in distribution. Therefore, as before, we can construct a 'fan' of indifference curves through each point of the diagram. And, as before, we can split up the total change into (1) a distribution change, which swings the indifference curve around the point where the change in distribution is made, and (2) a pure change in aggregate quantities (or rather of prices and aggregate income) without change in distribution, the latter being a change where there can be no incoherence.

As usual, however, we must be careful about criss-crossing. Instead of beginning with the distribution change, and taking the 'quantity' change afterwards, we shall get the correct comparability with our q-procedure, if this time we work the other way about, and swing the $B\beta$ curve around B. It is also important to notice that the intermediate position, when prices and aggregate income have changed to their B-values, but distribution remains as at A, will not normally engender the same demands for commodities as exist at B. This does not matter, since the intermediate position is only a step in the argument; we do not have to inquire whether it is realizable on the supply side. That 'unreal' quantities are consumed in the intermediate position of the p-theory signifies no more than that 'unreal' prices operate in the intermediate position of the q-theory. We are simply asking what *would* happen if prices and aggregate income were the same as at B and distribution were different.

As before, a swing in the indifference curve $B\beta$ will ordinarily entail a swing in its tangent, the bonus line Bb. When we take proper care over the translation, this emerges as the same result as before, that $\mathbf{L}_0$ (the price-weighted index corrected for the distribution effect) should be greater than $\mathbf{L}$, if there is to be an intersection. The two methods of analysis lead to the same formal result, which is, of course, as it should be.

[1] If $Y = (p.q)$, summed over all commodities and persons, $dY = (p.dq)+(q.dp)$. Along an indifference level, $(p.dq) = 0$ for each individual; accordingly, when each individual remains on the same indifference level, $dY = (q.dp)$. The change in the price of each commodity being the same for each individual, this establishes the required tangency.

19. The conclusion at which we have arrived, and which we have now confirmed, is capable of being illustrated in quite simple terms. Let us suppose (in imitation of a previous argument) that we are dealing with a case in which both of the observed indices (**L** and **P**) show a rise of roundabout 5 per cent. If we were prepared to make the classical assumption of a representative consumer, we could then conclude that the Laspeyre utility-indices (l and λ) would register a rise of at least 5 per cent., while the Paasche indices (p and π), though they must rise by not more than 5 per cent., must also mark a rise. If we were correct in our 'hunch' that prices are likely to move more harmoniously than quantities, we could also expect that the p-indices would move less eccentrically than the q-indices, so that λ and π might not differ very much from the 5 per cent. rise which is observed. How much difference is made to these results when we drop the classical assumption, so as to allow for the possibility of distributional change?

It is still true, from necessary inequalities that still hold (from the shapes of the curves) that λ and l must show at least a 5 per cent. rise. What is not excluded, as it was excluded on the previous interpretation, is the possibility that π and p might register a fall. But it is, of course, by no means necessary that they should do so. They might be moved in either direction by the distributional effect; and it is, of course, entirely possible (if the changes in distribution were of a random character) that they might not be moved at all. It is a quite particular sort of distributional effect which causes a movement in the dangerous direction; while if π and p would be significantly above unity, when no account was taken of the distributional change, the 'perverse' effect must be large if it is to upset the coherence. It would appear, from what has been said, that π is more likely than p to have this protection; its chance of maintaining coherence, whatever (in reason) happens to distribution, may therefore be better.

If there is a perverse distributional effect, and it is considerable, equality between the observed indices (**L** and **P**) is likely (as we have seen) to imply that if there had been no change in distribution, **L** would have been a good deal greater than **P**, being brought back into equality with **P** by the distributional effect.[1] This, I think, is the kind of condition which might be capable of being identified econometrically. If we knew whether it is of frequent occurrence, or whether (as I suspect) it is a rare case, we should be much further on.

20. That concludes what I have to say on the main problem of this section. All that remains is to give a brief indication of some other ways

[1] It may be well, at this point, to remind the reader that it is **L** which is tied to π or p by the curvature of the indifference curve. The same (distributival) movement that turns a (π) (> 1) into a (π) (< 1) will bring $\mathbf{L}_0$ *down* to **L**.

in which the same technique of generalization could be used. One may mention, in passing, that liberation from the classical necessity of equal division incidentally frees us from absurdities about indivisibility.[1] We are no longer obliged to slice the okapi, provided that we are willing to reckon the okapi 'consumer' as forming a class by himself! Full allowance for *lumpy* consumption would indeed require some careful adjustment of the continuity assumptions which are hidden away in our curves. But I have not considered it necessary to pay much attention to this, since the breaches of continuity could not be considerable in relation to our 'macro' aggregates, and the essentials of our analysis have been expressed in terms of inequalities, not of equations.

The remaining point which I do want to bring up is quite different.

We have allowed for heterogeneity among consumers, but have so far maintained the assumption that the wants of each individual consumer are fully integrated. Suppose we want to drop that assumption: is there anything we can do about it? I do not think there is anything we can do about it, in general; if our individuals' want-systems have *no* inner consistency, the question of measuring Real Income (by a utility measure) loses all sense. There is, however, a possibility of Partial Integration: the individual can make choices (consistent choices) among certain sets of goods, considered as means to the attainment of Objectives,[2] but among the Objectives themselves he can make no consistent choice. Of course, with a limited income at his disposal, he cannot satisfy his desire for one Objective more without satisfying that for another less; but it is possible that the choice between these wider alternatives may be too difficult to be made in a consistent manner.

Suppose that consumers' wants (or the wants of *some* consumers) are of this kind.[3] We can still apply the analysis which we have just been working out. We must simply treat each 'non-integrated' consumer as a bundle of separate 'consumers'. We can do this, for at no point in the preceding analysis have we implied that the 'individuals', out of whose wants the collective curves were compounded, were physically (or personally) separate from one another. Their role has been merely that of distinct want-systems. There is no reason why one person should not combine a number of distinct want-systems; nor (indeed) why a number

[1] See above, p. 12.

[2] *R.D.T.*, ch. 17.

[3] That they should be of this character is one of the most plausible alternatives to the classical assumption of an integrated scale of preference. It is also the most plausible interpretation of mathematical 'non-integrability'. As is shown in *R.D.T.*, ch. 4, a failure of transitivity must either imply circular ordering (which does not seem to be interesting economically) or a breakdown of the *gearing* condition which brings alternatives into contact with one another. It is the latter possibility which can be dealt with in the above manner (for which my debt to Dr. Morishima must again be acknowledged).

of persons (such as a family) should not have a single want-system in common.

What I claim to have shown is that the interpretation of rising Real Income as gain in want-satisfying power can be applied to heterogeneous wants, as to homogeneous. That there is an exception, where the application will not work, is admitted; but the distribution exception is no more important (and may be much less important) than that which persists in the homogeneous case, from the possibility that, after all, wants may have changed.

VI. Relaxing the Revelation Assumption

21. When we contemplate the task of extending the classical analysis, so as to deal with those sectors of the Social Income where the Assumption of Revealed Wants does not readily apply, we find an array of very large problems confronting us, consideration of which could lead us very far afield. A serious treatment of the investment sector would involve us in capital theory; a serious treatment of the public sector would take us near to political theory; at the tail end of an already lengthy article the temptation to roam in such directions must be resisted. I shall therefore confine myself here to a few formal points, which are reasonably relevant to the matters with which we have been so far concerned.

As soon as we extend our concept of Real Income to cover goods which are made available to the consumer (or user) in some other way than simple purchase, there are several aspects of the preceding analysis which require to be re-examined. We must doubtless proceed, in large measure, by fitting the non-marketed goods into some shadow or simulacrum of a market structure—considering that someone, somehow, is paying for them, and looking for evidence on which we can base an estimate of what is being paid. But it is a hopeless endeavour to assimilate these hypothetical 'markets' in every way to ordinary free markets. As soon as we pass beyond the ordinary free market, our problem is not only one of finding boxes into which the difficult parts of the Social Income can be fitted; it is also a question of the way in which these hypothetical markets can be supposed to work.

It is fortunate that this latter question can be examined, at least to some extent, without raising the major question of the valuation of those goods which by their nature are recalcitrant to simple pricing. The goods which are distributed in some other way than disposal on a free market may be such special goods, but they can be quite ordinary goods, which might be distributed through a market, though they happen not to be so. Cases of ordinary goods that are distributed in special

manners are provided by some goods that are consumed by their own producers,[1] and (of course) by goods that are distributed by a system of rationing.

For such goods as are not disposed of on a free market, two of the conditions on which we have been relying break down. Though we may find a convention to enable us to put 'prices' on the goods in question, these prices cannot play the parts which we have been ascribing to them. It is not possible for the individual to adjust his consumption, so that he chooses his most preferred position with the income and prices that are given to him; he cannot substitute one commodity for another at a given price-ratio, but either the 'price'-ratio varies with his consumption, or (as in the case of rationing) he cannot substitute at all. It further follows that the marginal rates of substitution between pairs of commodities are not brought into equality between different consumers. Distribution ceases (in general) to be an optimum distribution, in the limited sense in which we have been using that term.

So long as we could suppose our consumers to be acquiring their consumables on uniform-price markets, it did look (I have repeatedly emphasized) as if the p-utility measure gave us a better meaning for the concept of Real Income—a meaning which is more in accordance with the sorts of questions we want to have answered, and which is more likely, in application, to give us a measure that can be expected to behave in a reasonable way. But as soon as we pass to the consideration of cases where the price-system is not working, or not working 'properly', this primacy of the p-measure seems to disappear. It is indeed very hard to see how we can use the p-measure, when consumption ceases to be determined by income and by the prices confronting the consumer. The p-measure belongs to the free market; the possibility of measuring Real Income in that way is one of the many services which the existence of a market provides for economics.

What, however, of the q-measure? The q-measure is not so obviously dependent on the price-system, so that we may perhaps have done well to keep that alternative in play, ready for use when we need it. But the theory of the q-measure, as it has been given, has also relied upon the

[1] The phenomenon, it should be understood, is that of goods that are neither bought nor sold by those who produce them. If I grow potatoes, but not enough for my consumption, so that I buy some potatoes on the market, it is clearly correct to value my whole consumption at the price which I pay, since my position is the same as if I sold my crop at that price, and then bought back what I wanted to consume at that price also. If I grow potatoes, but more than enough for my consumption, so that I sell some on the market, it is similarly correct to value my whole crop at the price which I *get*—for identically the same reason. In both of these cases the price-system is working normally. But if I neither buy nor sell, though we may value my crop at something intermediate between the prices at which I could buy or sell, this intermediate price is not a market price and does not behave like one, since it rises (along my marginal cost curve) with my consumption.

price-system; if it is to transcend the price-system, it will require, at the least, some adjustment. What are we to mean by the collective indifference curve through A, when A is not to be automatically regarded as a distributive optimum? Unless we impose some rule about the distribution of goods between individuals as we go along the curve, the curve is not determined; but the rule which we previously employed, of wasteless distribution all along the curve, is not available, when A itself is not an optimum position.

Consider the following problem. At A certain goods are being produced, but are being distributed (by a bad rationing system) in a non-optimum manner; at B *identically the same goods* are being produced, but are being distributed in a more efficient way, so that (taking a strong case, to bring out the point) everyone is better off. There is (let us grant it to the Cardinalist, to the very heart of whose case I fancy we have now come) a gain in Utility; is there a gain in Real Income? For my own part, I want to say that there is a gain in Real Income; but it is clear that we have got to stretch things quite far in order to be able to say it.

We cannot apply our usual (q) technique to this case unless we can find a rule which shall tell us how other quantities of goods than those actually available are to be distributed on the A- and B-plans respectively. Only by such a rule can we identify anything corresponding to our intermediate positions—sets of goods distributed on the B-plan which are (collectively) indifferent with A, and sets distributed on the A-plan (collectively) indifferent with B. It seems only too likely that there will be no such rule to be found. Nevertheless, if it is once granted that the B-plan is not merely more efficient than the A-plan, but is itself an optimum distribution, things become better. We can then construct a number ($O\alpha$) of bundles that can be (optimally) distributed so as to make each individual as well off as he is at A; and the ratio $OB/O\alpha$ then gives us *one* measure for the gain from optimalization. Thus we can here get *one* measure, though we are not able to find a partner to check it.

This being so, the only way of comparing two non-optimum distributions will be to make an independent comparison of each with an optimum distribution of the same goods. But the optimum distribution which is to be taken as a standard of reference is not fully defined, and there is no certainty that the relation between A and B will look the same from the point of view of one optimum distribution C as from another. Here (as elsewhere) no great confidence can be placed in indirect comparisons. It must be admitted that the problem of comparing non-optimum distributions is on the edge of being insoluble; into these shadows the light which is cast by our present methods is dim indeed.

VII. Conclusion

22. It is tempting (but this temptation also must be resisted) to conclude by discussing the bearing of the principles we have been elaborating on crucial topics of Welfare Economics—to which field the latter part of our analysis has been coming very close. I will merely say that in my view the typical 'Welfare' problem can also be reduced to a comparison between two *positions*: only one of them now being an actual position, the other being a proposed alternative. The choice between such alternatives can be analysed by an adaptation of the methods which have been here described. It is a useful analysis, provided that it is sensible to divide the change from actual A to proposed B into productional and distributional components, distinguishing between the change in Aggregate Real Income which is involved and the change in the Distribution of that Income. That such a division is not always possible, is confirmed by what has been said here. But I think that what I have said does help to show the reason why, in the sort of world in which we live, it does usually seem possible to make it. In a world where it can be made, the economist has more of a job to do than he would have in a society where interests were more diametrically opposed.

But it may be argued that the distinction between the production and the distribution of Real Income is cleaner and tidier when Real Income is measured in terms of cost, instead of being measured by the utility measure with which we have been here concerned. Our concept of Real Income may be regarded as an identification of the collective indifference surface which passes through the point of current output; our problem of measurement has been a problem of estimating some relevant parameters of that surface. We have granted that the collective indifferent surface is liable to be moved by changes in distribution; if the movement is important, the line between productional and distributional components cannot, on this line of analysis, be clear cut. It could apparently be made much sharper if we measured in terms of the alternative outputs producible from the currently applied resources—taking our measure on the 'obstacle' side, as Pareto would have called it, not on the side of 'tastes'. For though resources applied may change when distribution changes, it is reasonable to abstract from that effect. We can then consider that a change in distribution requires no more than a movement along the *same* curve of obstacles (or 'production possibility curve', as Samuelson would call it).

Close analysis of the cost measure does, however, raise corresponding difficulties to those which have perplexed us over the utility measure; they can be classified in a rather similar way. On the 'integration' side, we have a major difficulty on what I have called *coherence*. We have granted that the collective indifference curves, based on our positions A

and *B*, *may* intersect; but we have to take great pains over our definition of the cost measure if we are not to find ourselves with a construction where intersections of the corresponding curves are almost inevitable. It may indeed be true that it is only in the case of a regularly growing economy, and then only if we insist that the comparison is to run in terms of long-period cost (in Marshall's sense of that term) that the cost method has any hope of providing a coherent measure. When we apply it to the measurement of fluctuations (or retrogressions) it is worse than the utility measure.

On the 'revelation' side, the assumption that prices correspond to marginal utilities is one that (over a large part of the field) is fairly digestible; but who could swallow, without the gravest reservations, the corresponding assumption about marginal cost? There seem to be no more, in this place at least, that needs to be said.

I hope, on another occasion, to investigate some of these problems of the cost measure much more fully. They are merely mentioned here, as a justification for my belief that in analysing the utility measure so elaborately, I have not been wasting time.

IS THE NATIONAL DEBT A BURDEN?

By J. E. MEADE

I

THE view is sometimes expressed that a domestic national debt means merely that citizens as potential taxpayers are indebted to themselves as holders of government debt, and that it can, therefore, have little effect upon the economy, except in so far as it may lead to a redistribution of income and wealth between taxpayers and owners of property. It is my purpose to refute this argument; to show that, quite apart from any distributional effects, a domestic debt may have far-reaching effects upon incentives to work, to save, and to take risks; and to examine the nature of these effects.

I shall say very little about the distribution of income and property. My thesis is that if the national debt could be removed in such a way as to leave the distribution of real income totally unchanged, then in certain specified ways it would improve economic incentives. In economic policy there is very frequently a conflict between the objectives of efficiency and of equality. Measures which improve incentives often increase inequalities; and measures which increase equality often blunt economic incentives. If it can be shown that the removal of the national debt in a way which did not affect the distribution of income would improve economic incentives, then it would not be difficult to show that the removal of the national debt in a way which did not affect incentives could be used to improve distribution.

This paper is concerned only with domestic debt. It is well known that an external debt is a burden on a community, since there must be a transfer of real goods and services from the debtor to the creditor country in payment of interest and sinking fund on the debt. A domestic debt, on the other hand, means merely a transfer from citizens as taxpayers to citizens as property-owners, so that there is no direct loss of real goods and services to the citizens as a whole.

But one must not conclude from this that a domestic debt has no adverse economic effects.[1] In order to examine these effects, a comparison

[1] Some excellent articles have been written to remove fears about the evils to be expected from an ever-growing debt. For example, Professor A. P. Lerner ('The Burden of the Debt' in *Income, Employment, and Public Policy*) shows that there is no reason to believe that the debt will grow without limit, even if a debt is always created to finance a budget deficit so long as total demand is deficient; for when the debt has grown to a certain size its 'Pigou-effect' (see p. 166 below) will serve to raise demand without further growth of debt. Professor Domar ('The Burden of the Debt and the National Income', *American Economic Review*, 1944) has shown that even if debt grows without limit, the rate of tax

will be made between two societies which are in every respect similar except that the one has a large domestic national debt and the other has no debt. This idea is a useful analytical device to isolate certain factors at work in society; but the concept is an artificial one and needs careful definition in particular in respect to the effect of the presence or absence of a national debt upon the distribution of income and property.

We can apply this concept by supposing that we move by means of a capital levy from a society with a national debt to a society without a national debt. But this capital levy is a purely analytical device.[1] We are really imagining two different societies, otherwise the same, except that history has left one with and the other without a national debt; and this is put in terms of assimilating the position of the former to that of the latter by means of a capital levy merely as a way of explaining in what sense they are otherwise the same.

Let us then consider a society with a large national debt. We will make one and only one simplifying assumption about distribution, namely that all citizens in any one given income bracket have the same ratio of income from work to income from property. The rich man may have a higher ratio than the poor man of unearned to earned income, but each rich man has the same ratio as every other rich man and each poor man has the same ratio as every other poor man. Suppose then that there is a capital levy of any degree of progression, the total levy being on a scale sufficient to redeem the whole debt. After the levy any citizen in any one income bracket will have a lower gross income according to the amount of income from property in that bracket and according to the progressiveness of the levy on property. Let us suppose that the scale of taxation on income is then so adjusted that each citizen in each income bracket gains in reduced taxation on income exactly what he loses in income from property.[2] Each citizen's net tax-free income remains exactly the same as before, so that the capital levy has left the distribution of personal incomes unchanged. If the capital levy was a proportionate one, it would also have left the distribution of property unchanged, in the sense that it would have

necessary to service it may not grow beyond a certain limit, if the national income is also growing. But these articles show only that the debt is unlikely to grow without limit relatively to the national income. They do not show that a given debt has no adverse effects.

[1] For the reasons given below (p. 180) I would not personally advocate an actual capital levy.

[2] This involves the assumption that each citizen is paying sufficient in income taxation for it to be possible to offset by a remission of such tax his loss of income from property resulting from the levy on his capital. But this assumption can be safely made in conditions in which (i) income taxation accounts for a large proportion of government revenue and debt interest for a small proportion of government expenditure, so that much revenue from income tax is needed even after the capital levy; and (ii) income taxation and the capital levy are both progressive and people with large incomes hold large amounts of property, so that the people who lose income from property are also the main payers of income taxation.

reduced all personal properties in the same proportion. If the capital levy was a progressive one, it would *pro tanto* have diminished the inequality of ownership of property.

There is, of course, a relationship between the degree of progression of the levy and the modification of the progressiveness of the existing taxation on income which is necessary to leave each citizen's net income unchanged.[1] But for our present purpose we can be content to conclude that on our assumptions in the society without the national debt (i) every citizen will own a smaller amount of property, (ii) every citizen's gross income will be lower, (iii) every citizen's average rate of taxation on income will be lower, but (iv) every citizen's net income will be unchanged.

II

What would be the effects of these changes on the citizen's behaviour? The first and foremost effect, but a strangely neglected effect, is the increased incentive to save which would be caused by the fact that each citizen's net income was unchanged while the value of his property had been reduced. Imagine the same individual in two situations; in both situations he has a tax-free income of £1,000 to spend or save; but in situation 1 he has £10,000 worth of property and in situation 2 he has only

[1] Let $e+pr$ be an individual's gross income, where e is income from work, p the value of property, and r the rate of interest on property. Let i be the rate of tax on his income before the capital levy, c the rate of levy on his capital, and i' the rate of tax on his income after the levy. For his net income to remain unchanged we have

$$(e+pr)(1-i) = \{e+(1-c)pr\}(1-i'),$$

or $\dfrac{1-i'}{1-i} = \dfrac{1}{1-ck}$ where $k = \dfrac{pr}{e+pr}$ or the proportion of his income which is unearned. Consider now an individual with a large total income denoted by subscript $_1$ and an individual with a small total income denoted by subscript $_2$. Then $\dfrac{1-i_1'}{1-i_1}$ is $> \dfrac{1-i_2'}{1-i_2}$ if $c_1 k_1 > c_2 k_2$. The modification in the degree of progression of the income tax is thus seen to depend on the progressiveness of the capital levy (c_1 and c_2), and on the factors determining k_1 and k_2 which are the distribution of income from work (e_1 and e_2), the distribution of property (p_1 and p_2), and the yield of income from property (r). Now if the rich man has a higher ratio of unearned to earned income ($k_1 > k_2$) and the capital levy is progressive ($c_1 > c_2$), then $c_1 k_1 > c_2 k_2$. In this case taxation of income must be so adjusted that the tax-free proportion of gross income goes up in a greater proportion for the rich than for the poor $\left(\text{i.e. } \dfrac{1-i_1'}{1-i_1} > \dfrac{1-i_2'}{1-i_2}\right)$. In this sense the taxation of income must become less progressive; and its degree of progression will be reduced the more, the more progressive *ceteris paribus* is the capital levy, i.e. the greater is c_1/c_2. But the mere fact that the rich man has a greater *absolute* amount of property than the poor man (even if the capital levy remains progressive) is not sufficient to cause the post-levy taxation of income to become less progressive in the sense defined above. A man with a large income may have a larger absolute income from property and yet a smaller proportion of his income coming from property than in the case of a poor man, i.e. k_2 can be greater than k_1. If the capital levy is only slightly progressive (c_1 only slightly $> c_2$), it is possible that $c_1 k_1 < c_2 k_2$.

£5,000 worth of property against a rainy day, or for his old age, or to leave to his family, or to supplement his present consumption by living on his capital. The amount which he would spend on goods and services would almost certainly be considerably greater in situation 1 than in situation 2; or, to put the same thing another way, a man's net savings will be higher or his net dissavings lower, the lower is the ratio of his capital to his tax-free income. We may call this the Pigou-effect.[1]

Professor Hicks[2] has estimated that in 1947–9 the domestic indebtedness of the government which was uncovered by any real assets (which I will call the 'deadweight debt') represented no less than 43 per cent. of all privately owned property. The removal of the deadweight debt could thus be considered as capable in those circumstances of reducing the representative citizen's property by 43 per cent. without reducing his tax-free income. This is what might be called a gigantic Pigou-effect and would clearly raise the incentive to save very greatly.[3]

This increase in the incentive to save is almost certain to represent an improvement from the point of view of society. If a reduction in the demand for consumption goods is desired either to reduce an inflationary pressure or to release resources so that investment can be raised in the interests of economic growth, the advantage is obvious. But even if no change in expenditure on consumption goods is desired, the increased incentive to save can be made to have advantageous indirect effects. For, in this case rates of taxation can be reduced so as to raise the citizens' tax-free incomes to the extent necessary to restore their demand for consumption goods; and these reductions in rates of tax will improve incentives for work and enterprise.[4]

Moreover, the fact that the removal of the deadweight debt would cause all personal properties to be smaller than before is likely to improve incentives for work and enterprise as well as for saving. Greater effort of every kind is likely to be made to be in a position to build up private fortunes when these are not already inflated by a deadweight debt.[5]

[1] See Pigou, 'Economic Progress in a Stable Environment', *Economica*, 1947.

[2] See Hicks, *The Social Framework*, 2nd ed., p. 109.

[3] We are not, of course, considering the effects of an actual capital levy, which might have other psychological repercussions upon the incentive to save, particularly if it were thought that the levy might be repeated. We are considering only how incentives in this country might differ from what they are if the past history of the country had been such as to leave it now with its present real income and real resources but without the deadweight debt.

[4] It should be noted that these reductions of tax rates made possible by the Pigou-effect are quite separate from, and additional to, any reductions in tax rates made possible through a saving of interest payments from the State budget, which are the subject-matter of the next section.

[5] Mr. N. K. Kaldor has suggested this point to me. I shall refer to it as the Kaldor-extension of the Pigou-effect.

III

The second major effect of the disappearance of the deadweight debt is the familiar one most usually discussed in this connexion, namely the improvement to incentives to save, to work, and to risk brought about by the reduction in rates of taxation which it would make possible directly as a result of the saving of interest payments on the budget. The argument is in principle a very simple one. The redemption of the deadweight debt would mean a saving in budgetary expenditure on interest on the debt. This would make it possible to reduce rates of tax; and this would improve incentives to earn larger incomes by more effort and enterprise.

That there would be some incentive to more work and enterprise and that this would mark an improvement in economic arrangements is almost certain. We are assuming that when the deadweight debt disappears each citizen experiences a reduction in the rate of tax on his remaining income which exactly offsets his loss of income from property. So far he is in exactly the same real position with the same real income—neither better nor worse off. The only change is that if he earns an additional unit of income he will keep more of it. He will then take steps to earn more because he starts with the same real income and can get another unit of income more easily than before. And this change must be an improvement from his point of view because he could, had he so wished, have made no change in his income or leisure; and, so long as any positive rate of tax remains on income, he is likely by further effort to add more to the wealth of society than he takes from society after payment of tax on his additional earnings.

But how important are these effects of reduced rates of taxation on income likely to be? It has often been argued that they will be quantitatively very small if (i) the market rate of interest is low, (ii) the progressiveness of existing rates of taxation on income are high, (iii) there is a high correlation between large incomes and large properties, and (iv) the progressiveness of the capital levy is also high.[1] In these conditions a large redemption of debt is likely to lead only to a very small net saving of expenditure on the budget and so to make room for only a very small reduction of rates of taxation. If the rate of interest is low, a given

[1] We are using the capital levy merely as an analytical device for comparing two otherwise similar societies, whose histories have differed in one way or another so that in one a large national debt has been contracted and in the other no debt has been contracted. Since a national debt involves the inflation of the total amount of privately owned property, the histories of our two societies must have differed in such a way that over the past years in one of them private citizens have been able to accumulate more savings than in the other. The assumption that the capital levy is progressive corresponds, therefore, to a difference in the past histories of our two societies such that it is those who were able to accumulate the largest sums in the one society who were most denied the opportunity to accumulate in the other.

redemption of debt will cause only a small gross saving of interest payment in the budget; if the levy on capital is progressive, if large properties are held mainly by people with large incomes, and if the marginal rates of tax on these incomes are very high, then most of this small gross saving of interest will itself be absorbed by a loss of revenue from the taxation of income. The net saving to the budget and so the consequential reduction in tax rates and so the consequential improvement in incentives to be expected from a redemption of debt will be very small.

The conditions which I have just enumerated existed in this country in the years immediately after the war; and for these reasons the existence of a very large national debt was not considered to have any seriously adverse effects on incentives. But, quite apart from the very important Pigou-effect, there are at least three reasons why the deadweight debt has been a more serious impediment to economic incentives than was generally recognized.

In the first place, the rate of interest was kept at a low level in large measure because of the existence of the national debt. These were years of heavy inflationary pressure. Reluctance to use monetary policy as one of the instruments to restrain inflation was greatly increased by the fact that an all-round rise in interest rates would immediately increase the budgetary burden of expenditure of interest on treasury bills and other short-term debt and would gradually lead to a rise in expenditure on longer-dated debt as it fell due for repayment.[1] With low interest rates a removal of the debt might cause only a small gross saving on debt interest; but it would mean that a rise of interest rates as an anti-inflationary device would no longer be open to the objection that it would seriously increase the budgetary problem. The removal of the national debt would thus have made it much easier to use the instrument of monetary policy flexibly for the control of inflation and deflation. Now that, for better or worse, interest rates have been raised to really high levels the argument can, of course, be put once more in its direct form. Rates of interest being high the redemption of national debt would mean a large saving of interest on national debt.

Our attitude to a deadweight debt must be much influenced by the surrounding economic climate. In times of economic stagnation like the 1930's, low interest rates and cheap money were most desirable in them-

[1] It is not certain that a rise in interest rates increases the net burden of a given national debt. This depends greatly on the structure of the debt. If the debt consisted solely of short-term bills it would not affect the capital value of the debt but would add to the interest payments and so raise the rates of tax needed to service the debt. If the debt consisted solely of irredeemable bonds it would reduce the capital value of the debt without raising interest payments. In the former case there would be an unfavourable effect on tax rates with no favourable Pigou-effect; in the latter case there would be a favourable Pigou-effect with no adverse effects on tax rates.

selves to stimulate investment; this had the incidental result that a given national debt did not involve very high rates of tax for its service and, at the same time, the Pigou-effect of a high capital sum of the debt in discouraging savings was positively beneficial. But in the present (and so much more desirable) world climate of economic development and buoyancy, high interest rates may be desired as a means of discouraging the least productive investment projects, and the Pigou-effect of the debt in discouraging savings is most undesirable. A deadweight debt may have been a blessing in the 1930's, but it is a curse in the 1950's.

Secondly, the fact that a progressive capital levy combined with a progressive system of taxation of income means that there is little scope for subsequent reduction in the existing schedules of taxation on income does not mean that it gives no increased incentive at the margin for greater work and enterprise. A capital levy reduces the property-owner's gross income; with a progressive system of taxation of income the reduction in the amount of his gross income by putting him into a lower income bracket causes the rate of tax on his income to be reduced. For this reason, even if there were no reduction whatsoever in the schedules of taxation of income after the capital levy, there would nevertheless be an improvement in marginal incentive. Because he was now in a lower gross-income bracket the representative taxpayer could keep a larger proportion of each additional £1 which he earned.

Thirdly, there is some reason to believe that a given reduction in the marginal rate of tax will be more important from the point of view of economic incentives when tax rates are high than when they are low. Consider two situations which are otherwise the same. In situation 1 the rate of income tax is 19*s.* 6*d.* in the pound because the cold war is on and there is a great deal of government expenditure on armaments to finance in addition to interest on the national debt. In situation 2 real peace has broken out and the rate of income tax is only 2*s.* in the pound because there is little government expenditure on armaments, though expenditure on interest on debt remains unchanged. Now in situation 1 remove just sufficient national debt to make possible a reduction of 6*d.* in the pound in the income tax while leaving every citizen with the same real income as before because his loss of interest on debt is just compensated by the fall in the rate of income tax. Then in situation 2 make a similar change; that is to say, remove that amount of debt which in situation 2 will permit a reduction of 6*d.* in the pound while leaving every citizen with the same real income. In situation 1 out of every additional £100 which he now earns a citizen can keep £5 instead of only £2. 10*s.* In situation 2 out of every additional £100 which he now earns he can keep £92. 10*s.* instead of only £90. The same reduction of tax of 6*d.* in the pound has in both situations left the

taxpayer's spendable income unchanged; but it has raised his *marginal* reward by 100 per cent. in situation 1 and by under 3 per cent. in situation 2. Since in the 'cold-war' situation our taxpayer is so much worse off than in the 'real-peace' situation we cannot say for certain that a 100 per cent. increase in his marginal reward without any change in his total reward will have a greater effect on the amount of work which he does in situation 1 than a 3 per cent. increase in his marginal reward without any change in his total reward in situation 2. But there is a strong presumption that he will increase his effort more in situation 1 than in situation 2.[1]

But even if he increased the amount of work which he did by the same amount in situation 1 when his marginal reward was doubled as in situation 2 when his marginal reward was increased by only 3 per cent., the reduction in tax would be much more important in situation 1 than in situation 2. In both cases his wage before tax measures the value of his marginal product, while his wage after tax measures the marginal disutility of effort to him. In situation 1 our citizen is working to a margin at which the value of his marginal product is no less than 40 times as great as the cost of his marginal effort (£100÷£2. 10*s*. = 40). In situation 2 the value of his marginal product is only $1\frac{1}{9}$ times as great as the cost of his marginal effort (£100÷£90 = $1\frac{1}{9}$). In the former case society as a whole stands to gain much more from additional work than it does in the latter case.

Thus it is certainly true that if the initial taxation of income is high and progressive, then a progressive capital levy will lead to only a small budgetary saving of interest on debt and will therefore permit only a small reduction in tax rates. But it is precisely when marginal rates of tax on income are high that a small reduction in tax rates may do much good.

IV

Up to this point the existence of death duties has been neglected. A removal of the deadweight debt would reduce the size of the average private holding of property; it would thus reduce the size of the average estate passing at death; and so with any given schedule of death duties it would reduce the annual revenue from such duties. This additional automatic loss of revenue, so it may be argued, still further weakens the

[1] If his elasticity of demand for income in terms of effort is equal to unity, then he is supplying the same amount of work in situation 1 as in situation 2. The outbreak of the cold war and the consequent increase in the rate of tax from 2*s*. to 19*s*. 6*d*. in the pound will have raised the marginal utility of money income to him (by reducing his tax-free income) in exactly the same proportion as it has lowered his tax-free wage in terms of money. Since he is doing the same amount of work, the marginal disutility of work is in this case the same to him in situation 1 as in situation 2. In both cases when debt is removed and the tax rate is lowered by 6*d*. the marginal utility of income is unchanged (because he loses in interest as much as he gains by paying his tax); but in situation 1 his net reward for doing more work is doubled and in situation 2 it is raised by less than 3 per cent. He will be certain in this case to increase his supply of work more in situation 1 than in situation 2.

case for a removal of the deadweight debt as a means of making possible a reduction of tax rates and so an improvement in incentives.

That one must be careful about this argument is forcibly demonstrated by the following consideration. If the rate of interest is sufficiently low, if the taxation of income is sufficiently high and progressive, if the capital levy itself is sufficiently progressive, if estates pass frequently enough by death from one owner to another, and if the rates of death duty are sufficiently high and progressive, then the removal of the deadweight debt may at existing tax rates cause budgetary revenue to fall by more than budgetary expenditure. The loss of death duties because of the reduction in the capital sum of personal properties may be greater than the small saving of interest after payment of income tax. To preserve the budgetary balance tax rates must be raised after the removal of the debt. The greater the national debt, the better the budgetary situation.

It is quite probable that in the years immediately after the war conditions were of this kind, so that the disappearance of the debt would have reduced budgetary expenditure less than budgetary revenue. Yet common sense rightly rebels against the conclusion that the great growth of debt during the war could have improved the budgetary situation in any basic sense. Where has the argument gone astray?

The answer is, of course, that there is no reason to believe that the balance between revenue and expenditure ought to remain unchanged when the deadweight debt is removed. In the modern economy the basic purpose of taxation is to restrain the demands of private citizens in order to release real resources from the production of goods and services for private consumption to the extent that they are needed to meet the demands of current government services and of the programme of capital development that, with given policies and institutions, the State and private enterprise plan to carry out. As a first approximation we should judge the extent to which tax rates can be reduced after the removal of the deadweight debt not by the criterion that the balance between budgetary revenue and expenditure should be unaffected, but by the criterion that the demand of private citizens for goods and services for private consumption should be unchanged. If this criterion is applied, there can be no doubt that the removal of the deadweight debt will permit some reduction of tax rates even in the extreme conditions which we have been envisaging, in which, because of the incidence of death duties, it will at unchanged rates of tax worsen the balance between budgetary revenue and expenditure.

This can be demonstrated by the following example. In both the pre-levy and the post-levy situations a representative citizen has a net tax-free income of £1,000, but in the former situation he possesses a property of

£10,000 and in the latter he possesses only £5,000 of property. His consumption will be greater in the first than in the second case simply because he has so much more property; and if death duties are high and progressive, his consumption in the first situation may be higher still because he is allowed to consume all his property during his lifetime but cannot hand much of it on to his heirs. But in the first situation the State will be enjoying a large revenue from death duties (since some citizens will be dying each year and handing on their considerable properties), whereas in the second situation the State will receive much less revenue from death duties because there is only half as much private property to hand on at death. Now, since *ex hypothesi* our citizen has the same tax-free income in both situations, the State has already reduced rates of taxation of income between the first and second situation sufficiently to leave him with the same net tax-free income, even though he has lost half his income from property. This in itself will have left the balance of revenue and expenditure in the budget unchanged, since the State has lost in tax payments by him exactly as much as it has reduced its interest payment to him. But the State will also have lost a large part of its revenue from death duties since there is now only half as much private property to pass at death. Nevertheless, because of the Pigou-effect the reduction in our citizen's property will have reduced his expenditure on consumption and tax rates must be reduced still further if private consumption expenditure is to be maintained. In other words, when the deadweight debt is removed not merely should the loss of revenue from death duties be totally disregarded, but in addition rates of taxation on income can properly be reduced by more than would be sufficient to maintain the previous balance between revenue and expenditure even if there had been no fall in revenue from death duties.

V

The disappearance of the deadweight debt would also have a revolutionary effect in the capital and money markets through changes in the amount and the structure of capital assets available to be held by the banks and the rest of the private sector of the economy, and this would have some marked effects upon economic incentives which we must now examine.[1]

Let us divide the assets available to be held by the private sector of our community into four categories, namely: Money, Bills, Bonds, and Equities. Money includes coin, notes, and bank deposits, on all of which no interest is paid but all of which are fixed in money value and can be

[1] See E. Nevin, *The Problem of the National Debt*, for a stimulating description and discussion of the effect of the debt upon the assets held by the various sectors of the United Kingdom economy.

transferred at a moment's notice with negligible cost. Bills, of which the three-months treasury bill is the pure example, are reliable promises to pay a fixed sum of money in a short time; their capital value when that time comes will be certain, but there is some possibility of moderate variations in their value with variations in the rate of interest before they reach maturity. Bonds, of which 2½ per cent. Consols are the pure example, are reliable promises to pay a fixed annual money income with no obligation to repay the capital sum; income from them is certain but their future capital value may vary widely with variations in the rate of interest. Equities include ordinary shares and real assets like machines; the income from them is uncertain and the rate of interest at which that income should be capitalized is also uncertain; their future capital value is subject to a double risk.

We will for the moment make two simplifying assumptions, both of which we shall in due course modify. First, let us assume that the disappearance of the deadweight debt does not disturb the banking system and that the total amount of coins, notes, and deposits made available by the banking system to the rest of the private sector of the economy remains unchanged. Second, let us assume that there is no attempt to keep the balance of revenue and expenditure in the budget unchanged, but rather that tax rates are reduced sufficiently to keep the total demand for private consumption goods at its previous level. In this case, since the market for finished goods is undisturbed, we can assume that there is no change in the absolute level of earnings expected on Equities.

There are two main ways in which the disappearance of the national debt might in these circumstances affect the incentive to invest, the first operating directly through the change in the amount of Bills-and-Bonds existing in the market and the second operating through the consequential changes in the prices of Bills, Bonds, and Equities.

The Kaldor-extension of the Pigou effect (p. 166 above) suggests that people might make all sorts of efforts to rebuild their private fortunes if they had been diminished by the disappearance of the deadweight debt. Such efforts might include greater activity on the part of business men, involving an increased incentive to invest in capital equipment. But there is an important influence operating in the opposite direction. The disappearance of the deadweight debt means that the entrepreneur (whether he be a private business man or be taken to represent the managing body of a joint-stock company) will have at his command a much smaller amount of assets—and precisely of assets like government Bills-and-Bonds on the security of which, or through the sale of which, it is especially easy to raise funds for the finance of capital development. Both because the ratio of his total assets to liabilities will be lower and because the ratio of

his readily realizable assets to other assets will be lower, the typical entrepreneur will be less able to finance projects of capital development, and the risks involved in doing so will be greater. Thus the incentive to invest may be increased, but the ability to finance investment is likely to be reduced, simply by the changes in the quantity of assets.[1]

VI

But the disappearance of the deadweight debt will affect the prices as well as the amounts of various assets; and these changes in price may also affect the level of investment. The disappearance of the deadweight debt represents, on the one side, a reduction by that amount in the total capital wealth of the private sector of the community and, on the other hand, an equal reduction in the Bills-and-Bonds available to be held by the private sector, the amounts of Money and of Equities available in the market, and the level of earnings expected on Equities being unchanged. But when a private citizen has £5,000 less capital to hold with asset prices and expectations unchanged, he is unlikely to choose to hold £5,000 less Bills-and-Bonds; although his reduction in holdings of Money, Bills, Bonds, and Equities will not necessarily all be in the same proportion, he is likely to want at current asset prices to hold somewhat less of each type of asset.[2] In other words the disappearance of the deadweight debt will cause a scarcity of Bills-and-Bonds relatively to Money and relatively to Equities; in an otherwise unchanged market situation, the price of Bills-and-Bonds will probably rise in terms of Money and in terms of Equities.

The rise of the price of Bills-and-Bonds in terms of Money represents a fall in the rate of interest. The rise in the price of Bills-and-Bonds relatively to that of Equities represents a rise in the risk-premium. The margin between the rate of yield on Equities, on the one hand, and on Bills-and-Bonds, on the other hand, will be increased. It will be easier to borrow for capital development by the issue of fixed interest debentures than by the issue of ordinary shares. There will be a premium on capital development of a safe kind.

It would, of course, always be possible for the government to offset this change in asset prices by itself supplying risk-bearing. This it could do by issuing Bills-and-Bonds and investing the proceeds in Equities, so that, while the deadweight debt was eliminated, there remained a considerable governmental liability in the form of government Bills-and-Bonds balanced

[1] The argument in this paragraph was suggested to me in discussion by Mr. N. Kaldor.

[2] He will presumably wish to reduce his holding of foreign assets as well as of domestic assets. In this way a reduction of domestic deadweight debt might cause some easement on the capital account of a country's balance of payments.

by an equal asset in the form of governmental investments in private industry.[1]

But suppose that the government took no such action. Then, as we have seen, there will be some rise in the price of Bills-and-Bonds in terms of Money; this will represent a fall in the pure rate of interest; and a lower pure rate of interest is a price change which may help to stimulate some extra investment in safe, long-term projects such as house-building.

But a change in the price of Equities (which represents the market valuation placed on machines and other real assets in industry) is more likely to affect investment than is a change in the price of Bills-and-Bonds. Bills-and-Bonds go up in terms of Money and in terms of Equities. But will Equities go up or down in terms of Money?

The outcome will depend upon whether Bills-and-Bonds are better substitutes for Money than for Equities or whether, on the contrary, they are better substitutes for Equities than for Money. When the government Bills-and-Bonds disappear, the amounts of Money and of Equities remaining unchanged, the representative private citizen has got to increase by a given amount the proportion of his assets which he holds in Money and by another given amount the proportion of his assets which he holds in Equities. If Bills-and-Bonds are a good substitute for Money, then only a small rise will be needed in the money price of Bills-and-Bonds to persuade the representative citizen to make the needful shift into Money; and if Bills-and-Bonds are a bad substitute for Equities, a large rise in the price of Bills-and-Bonds will be necessary in terms of Equities to bring about the needed shift into Equities. In these conditions there will be only a small rise in the money price of Bills-and-Bonds, i.e. only a small fall in the pure rate of interest; and the increase in the risk premium will be large and will be brought about by a fall in the price of Equities. Similarly, in the opposite conditions where Bills-and-Bonds are a bad substitute for Money but a good substitute for Equities, the price of Bills-and-Bonds will rise a lot and the rate of interest will fall a lot in order to cause the necessary shift to Money; but the risk premium will have to rise only a little to cause the necessary shift to Equities, so that the money price of Equities will rise almost as much as the money price of Bills-and-Bonds.

Which of these two things is likely to happen in fact? We must distinguish between Bills and Bonds. Bills are more like Money than are

[1] In terms of our analytical capital levy this result would be brought about and all asset prices would remain unchanged if those liable to the capital levy were allowed at their choice to pay in Money, Bills, Bonds, or Equities, and if the government after cancelling any government Bills-and-Bonds which the payers of the levy surrendered, itself held on to the other private assets handed over to it, leaving outstanding in private ownership any government Bills-and-Bonds which had not been surrendered to it in payment of the levy.

Bonds, and Bonds are more like Equities than are Bills. When the private citizen loses his Bills he is likely to go for Money. But in fact most government short-term debt is held by the banks. As long as we are assuming that the banks are not disturbed by the change but supply an unchanged amount of money, the effect of the disappearance of the national debt on the private sector's structure of assets will be mainly a loss of Bonds. When property-owners are starved of Bonds will they shift to Money or to Equities?

There is, I think, no simple answer to this question. One can imagine circumstances in a mature economy with a tendency to secular stagnation in which exceedingly low rates of interest are necessary to prevent deflation, so that a further fall in interest rates is almost out of the question. In this case an increased risk margin will show itself in a fall in the money price of Equities rather than in a rise in the money price of Bonds. The disappearance of the deadweight debt will have made an already deflationary situation still more deflationary. On the other hand, one can imagine a buoyant situation in which interest rates are very high and in which it is the scarcity of capital rather than of risk bearing and of profitable opportunities for investment which holds back further development. In these circumstances a scarcity of Bonds might well cause a substantial fall in the rate of interest which might carry upwards the money price of Equities; and in this case, in so far as price effects in the capital market are concerned, the disappearance of the national debt would have made an inflationary situation still more inflationary.

But the analysis in the last paragraph has not allowed for the fact that substantial deflations or inflations of the general level of prices may be in progress and may be expected to continue. The capital value of Bills and the interest payable on Bonds are fixed in terms of Money; in the case of Equities, neither capital value nor yield is fixed. For this reason in times of rapidly changing money prices Bills and Bonds are likely to be better substitutes for Money than for Equities. This is an added reason why the disappearance of the national debt is likely to exert a deflationary influence on the price of Equities.

VII

We have still to modify our two assumptions that the disappearance of the deadweight debt does nothing in itself to affect either the absolute level of earnings expected on Equities or the total supply of Money. In fact in both these respects also it might exert a strong deflationary force.

For the reasons developed in Section II above, the disappearance of the

deadweight debt would be likely to increase the propensity to save. The effects of this we have so far assumed to be offset by a reduction of tax rates by the government sufficient to restore private expenditure to its previous level. But, of course, tax rates might not be reduced in this way. The increase in savings and decrease in expenditure on consumption goods caused by the disappearance of the deadweight debt might be acceptable to the government if there was initially a strong inflationary pressure which it was desired to counteract. Or the reduction in the demand for consumption goods might be acceptable even in the absence of any inflationary pressure, if it was thought that too much of the community's resources was being devoted to consumption and too little to investment. In this case the reduced expenditure on consumption, by causing a fall in the absolute level of earnings expected on Equities would cause an undesirable deflationary pressure. In order that this should not cause an actual deflation of total demand, it would then be necessary for there to be an increase in total investment expenditure equal to the reduction in expenditure on consumption goods. To engineer an increased expenditure on capital development, when the market for finished consumption goods was actually being contracted, might require a very large increase in monetary liquidity and fall in interest rates or risk premium. In such circumstances the disappearance of the deadweight debt might well be deflationary unless the total supply of Money were considerably increased.

But how would the supply of Money react to the disappearance of the deadweight debt? At present the supply of Money depends upon the liquidity of the banking system which depends upon the issue of a sufficient amount of liquid treasury bills to be shuffled about between the Bank of England, the Discount Houses, and the Clearing Banks. If these higher banking mysteries remain unchanged, then the disappearance of the deadweight debt including the disappearance of all government Bills would make the banking system highly illiquid and would cause a reduction in the supply of Money.[1] This deflationary effect could be offset if the government, while its net debt was zero, issued Bills to the banks and invested the money so borrowed in private Bonds or Equities. The government would buy private Bonds-and-Equities with government Bills in order that the banks might buy Bills with Money, unless there were a change in banking arrangements so that the banks themselves in these conditions bought Bonds and Equities with Money.

[1] If the national debt consisted entirely of Bills held partly by the banks and partly by private owners and if, as is probable, Bills are a good substitute for Money, then the disappearance of the national debt would cause a large reduction of Money-and-Bills with an unchanged stock of privately issued Bonds-and-Equities. In this case the money prices of Bonds and of Equities would fall. In other words, the pure rate of interest would rise because the change would be essentially one of reduced liquidity.

VIII

Whether the net effect of the disappearance of the deadweight debt would be inflationary or deflationary rests upon a complex balance of forces. The outstanding deflationary possibility would be its effect upon the banking system. If all treasury bills disappeared there would in present conditions be a catastrophic monetary deflation. Let us leave this on one side and assume that some alternative method is found for controlling the supply of Money. This is a *sine qua non* for the removal of the deadweight debt.

There would remain a number of conflicting forces at work.

(i) Because of the Pigou-effect people are likely to spend less on consumption and to save more, which in itself will be a deflationary force.

(ii) Because of the Kaldor-extension of the Pigou-effect and because of reductions in marginal rates of tax people are likely to produce more goods and services. Since producers are likely to increase their expenditures by less than their incomes (particularly when rates of taxation on incomes are high and progressive), this is likely to increase supplies relatively to demand and to exert a deflationary influence.

(iii) Entrepreneurs will have a smaller amount of easily realizable assets in their ownership and this will make the finance of investment more difficult.

(iv) If Bonds are a good substitute for Money and a poor substitute for Equities, then the disappearance of government Bonds is likely to cause only a small rise in the price of Bonds but a large fall in the price of Equities. This would probably exercise a deflationary effect upon investment. If, on the other hand, Bonds were a bad substitute for Money and a good substitute for Equities, the prices of Bonds and Equities would both rise with a consequential inflationary effect upon investment. But, as we have seen, in periods of rapid fluctuations in commodity prices, Bonds are unlikely to be a good substitute for Equities, and the inflationary effect upon Equity prices is not very probable in such circumstances.

(v) The desire to rebuild private fortunes which have been reduced by the disappearance of government debt might stimulate business men to greater risk-bearing and enterprise and thus to a higher level of expenditure on investment programs.

On balance it would appear probable that, even apart from any effects on the supply of Money through the banking system, the disappearance of the deadweight debt would exert a significant deflationary influence. But, provided always that the government has a firm grip upon monetary institutions and policies and is prepared so to control its monetary and fiscal policies as to stabilize the total demand for goods and services, this in present-day conditions must be counted a great advantage of the

removal of the debt. In present-day conditions of economic expansion and buoyancy interest rates and rates of taxation have to be kept at otherwise undesirably high levels in order to avoid the threat of inflation. The disappearance of the deadweight debt could provide just the occasion for an otherwise desirable relaxation of monetary and fiscal conditions.

The danger might, however, remain that through the increased difficulty of finding finance for risky investment projects and through an increase in the risk premium on Equities, there would be a special deterrent to innovation and to the application of new and risky techniques. To counteract such a tendency it might be necessary for the government to relax its monetary and fiscal policies in ways which specially favoured innovation and enterprise (e.g. by tax allowances for new investment), and to introduce new arrangements for the provision of risk capital through public or semi-public institutions. But, given this, the disappearance of the deadweight debt could be made the occasion for a great improvement in economic incentives.

IX

This paper has been devoted to the question whether an internal national debt is an economic burden or not. The method of analysis of this problem has been to remove the debt by means of an imaginary capital levy to see what difference this would make to economic incentives, if everything also remained unchanged. Our analysis has suggested that in certain important respects the existence of a large deadweight debt seriously blunts economic incentives. But before we rush to rebuild society with a zero deadweight debt there are two further questions which would require extensive investigation. In this paper they can only be briefly mentioned.

The first remaining problem is this. Granted that a positive deadweight debt is a burden, it does not follow that the optimum size for the deadweight debt is zero. Perhaps a negative debt would be still better. Or in terms of our national capital levy, why should the total levy be just equal to the deadweight debt? Might there not be advantages if it were still bigger and left the State a net creditor instead of a net debtor to the private sector of the economy? The argument for such a development runs as follows. The government has expenditures to finance on defence, justice, police, education, health, and social security. For this it has to impose taxes. Rates of tax cause divergences between efforts and rewards and thus interfere with economic incentives. If the State was a net owner of property which it itself used productively or hired out to the private sector of the economy, it would itself obtain a net income from rents, interest, and profits which it could use to finance part of its expenditures so that

rates of tax could be further reduced. Provided that the State's property was devoted to uses where the marginal social return on it was at least as high as it would have been if it had been left in private ownership, the reduction in tax rates would represent a further net improvement in economic incentives; and there would, of course, be a still greater Pigou-effect stimulating private savings.

There would remain the question of the kind of assets which the State should hold. Some assets, like roads, schools, and the equipment of nationalized industries are obvious candidates. But for the rest should the State invest in private Bonds or in private Equities? If it invested its funds in fixed charges like ground rents, mortgages, and debentures, it would still further usurp the function of the private rentier. The private-property-owner would willy-nilly be forced to become more and more of a private risk bearer, if not an actual entrepreneur. If, on the other hand, this would reduce the supply of risk-bearing too seriously, the State would have to hold private Equities rather than private Bonds; and an arrangement which was devised in the first place to give the State an income from property would have the indirect effect of forcing the State into participation in the management of private industry.

But with the present gigantic deadweight debt these problems are all ones for a still far distant Utopia. We should be happy enough to see a substantial reduction in the debt without demanding even its total elimination, much less its replacement by a net ownership of property by the State. Even so, there remains the great practical question: how is the reduction to be effected? The fact that the deadweight debt is a serious and real economic burden does not itself prove that it should be removed or even reduced. It might be a good thing if it had never existed; but it does exist and the best cure might be worse than the disease.

The first possibility is to use the capital levy not merely as a tool of economic analysis, but also as a practical means of debt redemption. I have been persuaded that we should not.[1] We have to face the following dilemma. A levy can be successful only if it is not expected that it will be repeated, since the expectation of a further levy would destroy all incentives to save. A successful levy will lead to the expectation that it will be repeated unless it is on such a scale that there remains no case for a repeat. But a levy on this scale would present such problems of administration and valuation, would so disturb the structure of the capital market, and would involve such vast changes in personal wealth that it really lies outside the range of what is practicable or suitable in our evolutionary methods of social and economic reform.

[1] The argument is exceedingly well put by Mr. C. A. R. Crosland in pp. 311–18 of his *The Future of Socialism*.

But alternative and less revolutionary methods are available to reduce the burden of the national debt. We may perhaps take the ratio of deadweight debt to total privately owned property as an index of the relative size of the debt. There remain three ways of reducing this proportion, namely: inflation, private savings, and public savings through budget surpluses.

First, it can be very effectively reduced by inflation. This has in fact been happening since the war. In the nine years since 1947–9 the general level of money prices of fixed assets in this country has risen by some 45 per cent. In 1947–9 43 per cent. of private property was deadweight debt.[1] If this 43 per cent. remains fixed in money values and the other 57 per cent. rises by 45 per cent. in money values, then the deadweight debt represents only 34 per cent. instead of 43 per cent. of total private property.[2]

Second, the relative importance of the deadweight debt can be reduced by the accumulation of private savings.[3] Such savings, matched by an expansion of the community's real capital assets, represent a growth of total privately owned property, so that any given amount of deadweight debt will represent a smaller proportion of total privately owned property. In the nine years 1948–57 total private savings reckoned at 1948 prices amounted to about £6,100 million, which represents an addition of some 15 per cent. to the £40,500 million of total privately owned property which was estimated to exist in 1947–9.[4] Such an increase would reduce the proportion of deadweight debt to total privately owned property from 43 per cent. to 38 per cent.

Third, there is the old-fashioned method of debt reduction through an annual surplus of revenue over expenditure in the State budget. Such public savings have a double effect in reducing the proportion of total privately owned property which takes the form of deadweight debt. Suppose that the government has an excess of revenue over current expenditure of £1 million. If the government invests this sum in new public works like schools, then £1 million of existing government debt ceases to be uncovered by real assets. Privately owned property remains

[1] J. R. Hicks, loc. cit.

[2] I would like to thank Mr. J. Longden of the Faculty of Economics and Politics, University of Cambridge, for help in the preparation of the estimates in this and the following paragraphs.

[3] For this and the following paragraph the total savings of the community have been divided between private and public savings. Private savings include the surpluses of public corporations as well as the undistributed profits of ordinary companies. The realization of assets for the payment of death duties has been treated as a reduction of private savings and accordingly the receipt of death duties has been allowed to swell the budget surplus. The current revenue of the public authorities and so their savings also includes the receipts of foreign aid. Public savings include the surpluses of local authorities as well as of the central government.

[4] J. R. Hicks, loc. cit.

unchanged in total, but it consists of £1 million less of deadweight debt and £1 million more of claims backed by real assets. If the government uses its surplus of £1 million to redeem outstanding national debt, then private owners must hold £1 million less of government debt and they must invest this sum in £1 million worth of additional private real assets. The ratio of the former to the latter has fallen both because the former has decreased and also because the latter has increased. During the nine years 1948–56 public savings amounted at 1948 prices to some £3,100 million. If we subtract this figure from the £17,500 million of deadweight debt outstanding in 1947–9 and add it to the £23,000 million of other privately owned property, outstanding at that time,[1] the ratio of deadweight debt to total privately owned property is reduced from 43 per cent. to 36 per cent.

Nowadays, the desirability of a budget surplus is often argued on one or both of two grounds: first, that high levels of taxation and low levels of governmental expenditure are desirable in order to exert a disinflationary pressure in an inflationary situation and, second, that public savings through a budget surplus are a desirable supplement to private savings in order that, in the interests of economic growth, more resources may be devoted to capital development at the expense of immediate consumption. I would like to restore a third old-fashioned argument for a budget surplus, namely, that it will help to reduce the national debt and thereby improve economic incentives in the future.

Additional taxation even if it were paid wholly out of savings (i.e. even if it caused no reduction at all in private consumption and therefore served no useful purpose in fighting inflation or promoting economic growth) would nevertheless serve a useful purpose in debt redemption. It would reduce the amount of national debt held by individuals even though it caused no net increase in their holding of other assets. Of course, taxes imposed for this purpose as for all others should have as little adverse effect as possible upon current incentives for work and enterprise; the point is only that if taxes are imposed for debt redemption, they are not to be ruled out because they are paid out of private savings. Death duties and annual taxes assessed not on income but on the value of privately owned property may fall into this category. Such taxes may have the smallest adverse effects upon work and enterprise (though it would be rash to claim that they have no such effects), but they are likely to be paid wholly or in large part out of private savings. It might be wise to build up a considerable budget surplus financed out of these taxes and to use it for the redemption of the national debt.[2]

[1] J. R. Hicks, loc. cit.

[2] Taxes of this sort (and in particular death duties) are not of the kind whose rates can appropriately be frequently varied. In so far as variations in tax rates are needed to

A budget surplus can also be achieved by a reduction in budgetary expenditure in so far as this is not offset by a reduction in rates of taxation. If expenditure is reduced for the purpose of debt redemption, the future advantages of a lower national debt are gained at the expense of the present restriction of government expenditure below the level which would otherwise be considered desirable.

Indeed we are faced, as so often in economic policy, with a dilemma. There would be great future advantages in improved economic incentives if the debt were reduced. But the methods of doing this are likely to worsen economic conditions in the immediate present. Inflation is the great debt-reducer, but has many other bad marks to be set against it. Private savings may be stimulated, but after a point only by means of systems of taxation which involve a reduction in public savings or are undesirable on distributional or similar grounds.[1] A budget surplus can be achieved only by further increases in tax rates or by a reduction in other budgetary expenditures—when it is a main purpose of debt reduction to enable a given level of other budgetary expenditures to be maintained without the disincentive effects of high taxation. The purpose of this paper is the limited one of showing in what ways the existence of a large national debt blunts economic incentives; it has not attempted to assess the balance between the immediate costs and the ultimate gains of different methods of debt reduction.

CHRIST'S COLLEGE
CAMBRIDGE

control total expenditure in order to avoid inflations and deflations of demand, alterations in rates of taxation on income or on purchases are more appropriate. But if, over and above such taxes, there is a considerable and fairly stable revenue from death duties and other taxes which are paid out of savings, it should be possible normally to run a considerable budget surplus. Any reductions in other taxes which may then at any time be needed to offset the threat of a general deflation will involve the reduction of a budget surplus rather than the incurring of an actual deficit. Revenue from taxes paid out of savings thus allows fiscal measures to be used for reflationary purposes without a budget deficit and thus without building up once more a deadweight debt.

[1] I would exempt from this criticism any shift from a progressive tax on income to an equally progressive tax on expenditure which, if administratively practicable, should greatly stimulate savings without other seriously adverse effects.

AUTOMATIC MARKET CLEARANCE AND INNOVATIONS IN THE THEORY OF EMPLOYMENT AND GROWTH[1]

By WILLIAM FELLNER

A. The Meaning of Say's Law

The essential content of Say's Law expresses itself in the proposition that the free (competitive) market always tends to create sufficient effective demand for capacity production. This regardless of the size of the money supply.

With some disrespect for history, Say's Law or the Law of Markets allowed itself to be recognized before the birth of Jean Baptiste Say, although Say probably was the first writer to express the proposition very forcefully. The proposition was considered an essential part of economic theory for about a century and a half. In the nineteen-twenties and particularly in the thirties, a reorientation took place in the course of which most members of our profession removed Say's Law from the framework

[1] The Marshall lectures presented by the author in Cambridge in 1957 and lectures presented in Oxford were based on the analysis contained in this essay.

As for the controversial issue of Say's Law and the neutrality of money, the reader may wish to consult Hume's essays on *Money* and on *Interest*; ch. 15, bk. i in Say's *Traité*, and his *Letters to Malthus*; ch. 21 in Ricardo's *Principles* and his *Notes on Malthus*; bk. ii in *Malthus's Principles*; ch. 4 in James Mill's *Elements*; ch. 5 in Chalmers's *Political Economy*; ch. 13, bk. iii, and ch. 4, bk. iv, in J. St. Mill's *Principles*; Marshall's *Money, Credit and Commerce* (to be referred to later more specifically); pt. vi in Walras's *Elements* (ed. Jaffs'); Pigou's *Employment and Equilibrium*, his 'The Classical Stationary State' (*Economic Journal*, 1943), and his 'Economic Progress in a Stable Environment' (*Economica*, 1947); Tobin, *A Dynamic Aggregative Model*, *Journal of Political Economy*, April 1955; Patinkin's *Money, Interest and Prices*.

As for the distinction between the money rate and the real rate of interest see particularly Fisher, *The Theory of Interest*; but also Marshall's early discussion in the *Contemporary Review* (1887; reprinted in *Memorials*, ed. Pigou).

In connexion with the problem of the character of innovations, see pt. ii, vol. i in Wicksell's *Lectures*; Hicks, *The Theory of Wages*; Harrod, *Toward a Dynamic Economics*; Joan Robinson, *The Rate of Interest and other Essays*, and her *The Accumulation of Capital*; the present writer's *Trends and Cycles in Economic Activity*; Solow, 'Technical Change and the Aggregate Production Function' (*Review of Economics and Statistics*, 1957).

Sources on which the empirical statements in section B, *infra*, are based, are cited in the present writer's op. cit., particularly in appendix to pt. 3. (These include the work of Kuznets, Goldsmith, Budd, and some of the author's own computations for the United States; and the works of Phelps Brown and his collaborators for the United Kingdom, particularly that of Phelps Brown and Weber and of Phelps Brown and Sheila Hopkins.)

The general concept of long-run growth in 'savings investment equilibrium' (i.e. the concept of dynamic equilibrium), has become developed and formalized especially by Harrod (see his 'Essay in Dynamic Theory', *Economic Journal*, 1939, and his op. cit.); and by Domar (see his *Essays in the Theory of Economic Growth*). Many of the ideas which have become incorporated into these models can of course be traced to earlier works, although they were not cast into this sort of framework. Even if we do not wish to go back beyond the turn of the present century, Wicksell's, Robertson's, and Keynes's work should be mentioned in this context. The Harrod-Domar models aimed at great simplicity, and are therefore deliberately 'rigid', much more so than is the framework which will be used here.

which they were employing for the analysis of economic problems. A new phase of the discussion started when in the nineteen-forties Professor Pigou posed the question concerning the *analytical foundations* of Say's Law for the first time in a truly articulate fashion. It reigned for a century and a half; then became highly suspect; what is the analysis behind it?

In recent years many of us have come to realize that, on assumptions which were vaguely implied in earlier writings and which with Pigou's and Patinkin's guidance we can now make explicit, Say's Law is a valid theorem. However, in the course of our present analysis we shall see that in the interpretation of this theorem it is essential to distinguish between static (stationary) equilibrium and paths of normal growth. In static equilibrium Say's Law appears in the company of other, closely related propositions. Along paths of shifting equilibria it becomes divorced from these other propositions and thus becomes a very poor guide. This is the basic reason why it is inadvisable to try to rely upon Say's Law along paths of shifting equilibria, where all changes are gradual and can be conceived of as predictable. In such a context of gradual and predictable movements, institutional rigidities do not in themselves explain why an economy that was made to 'test' Say's Law would be functioning unsatisfactorily.

I am implying here that Say's Law can be established only with the aid of the real-balance effect, that is only by showing that a change in the general price level changes the relationship between the supply of real balances and the demand for these and therefore changes the demand for goods. For example, given the nominal money supply and the preferences of the public, a fall in the general price level will increase the real value of the public's existing liquid wealth, and part of this improvement in the position of wealth owners will express itself in an increased demand for goods. Only by this reasoning can we prove that the flexible wages and prices of free markets eliminate any tendency toward aggregative excess supply of goods or of labour.

This view requires a brief defence. Could it not be maintained, *without* falling back on Professor Pigou's or Professor Patinkin's sophistication, that we would be living in a world of Say's Law if the public had a demand merely for working balances and none for idle balances (i.e. none for contingency balances or speculative balances)? Or could it not be claimed that we would be living in a world of Say's Law even if there existed a demand for idle balances, as long as downward adjustments of the interest rate could be depended upon to reduce or eliminate net saving at the capacity income and thus to eliminate any demand for *additional* idle balances? Do we not have here a simpler way of explaining what earlier economists had in mind when asserting the validity of Say's Law? They postulated that the public does not hoard its earned income 'in the long run'.

However, this interpretation also brings in the real-balance effect, albeit the assumptions underlying this interpretation are so simple that the corresponding version of the real-balance effect becomes almost a triviality. What we are essentially saying in the case of 'no hoarding' is that prices will always adjust in such a fashion that precisely the existing supply of money should be needed as a stock of *working* balances when production is at full capacity. In the 'no hoarding' case—say, in the case of a small and interest-inelastic Marshallian k—it is the price adjustments that make the existing supply of money just right as a stock of *working* balances, as indeed it is the price adjustments that can make the existing supply of money just right also in the case where money is held for other reasons too, and where this other demand is elastic to interest and may change from one period to the next. I will therefore continue to regard Say's Law as being based on price-flexibility assumptions and on the real-balance effect. Thus, Say's Law cannot be refuted by the statement that it is not valid if the general price level is kept rigid. The inference that the market equilibrates itself is not *supposed to be* valid in the event of price rigidities, just as the sugar market is not supposed to be cleared if the price of sugar is kept artificially high. It would be most unwise to overlook price rigidities and imperfections of competition. But this is a different question which, as we shall see later, does not bear on the main problem of this paper as closely as might be expected.

B. Say's Law and the Neutrality of Money in Static Equilibrium

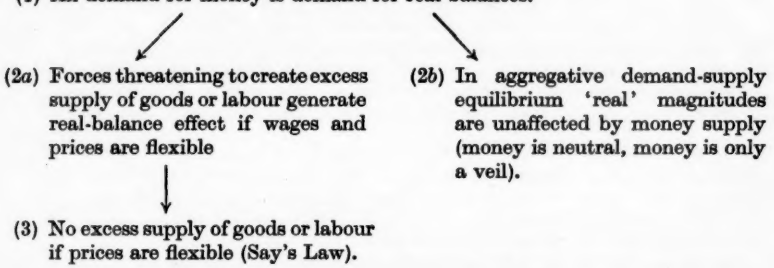
In the classical and neoclassical writings there is much that strongly foreshadows the Pigou-Patinkin argument. Especially Hume, Marshall, Wicksell, and Walras may be referred to in this connexion. Nevertheless, until recently insights that can be linked very easily to what now appears to be the correct argument lived side by side with wrong (tautological) statements about this problem. These statements suggested either that Say's Law could be derived from propositions which already *postulate* equilibrium of aggregative demand and supply (as does the general money-neutrality proposition); or that Say's Law somehow emerges as a by-product when propositions *postulating* equilibrium in demand and supply are presented as following from 'rationality'.[1] In reality it is of course necessary to establish Say's Law before we claim significance for any theorem implying full clearance of the commodity and factor markets (e.g. before claiming relevance for the general monetary-neutrality theorem or for such dicta as that money is merely a veil).

At this point I would like to give a schematic formulation of the relationship between Say's Law and the general theorem of monetary-neutrality.

[1] See n. 1, p. 190.

It will be seen later that this formulation applies only to static equilibrium, in the sense of equilibrium with investment zero. My formulation will, of course, incorporate the results of the Pigou-Patinkin analysis without which all these relationships would still be in a state of haze.

In static equilibrium, where zero net investment is taken for granted, the real-balance effect and Say's Law have the same origin as the general monetary-neutrality theorem. Neutrality of money means that a change in the supply of money changes merely the general price level but none of the other variables of the system, particularly not the rate of interest. This proposition presupposes that all demand for money must be interpreted as a demand for real balances; and it also presupposes aggregative demand-supply equilibrium which too must be derived from the prior assumption that the demand for money is a demand for real balances. We thus obtain the following mutually consistent propositions.


(1) All demand for money is demand for real balances.
(2a) Forces threatening to create excess supply of goods or labour generate real-balance effect if wages and prices are flexible
(2b) In aggregative demand-supply equilibrium 'real' magnitudes are unaffected by money supply (money is neutral, money is only a veil).
(3) No excess supply of goods or labour if prices are flexible (Say's Law).

Thus, in stationary equilibrium, price flexibility ensures Say's Law and full-capacity production by an adjustment which excludes any influence of a change in the money supply. Having established this we may conclude that the general neutrality of money is assured for changes in the money supply in full equilibrium. The main body of classical and of neoclassical literature did not make sufficiently clear the role of the real-balance effect in this reasoning. The argument sometimes proceeded as if it were possible to establish the relevance of (2*b*) directly from (1), *without* relying on (3) to establish aggregative demand-supply equilibrium; and as if subsequently (3) could be deduced from (2*b*). In reality (3) is needed to establish aggregative demand-supply equilibrium, and thus to establish the relevance of (2*b*). Pigou's and Patinkin's analysis enables us now to develop this set of propositions for static equilibrium with proper recognition of the relationship between (2*b*) and (3).

A few general comments on the doctrinal history of the problem are included in a footnote below.[1] Before ending this section we must, however,

[1] The tautological sequence moving from proposition (1) in our table to (2*b*) and from there to (3), or letting (2*b*) and (3) emerge together from (1), without awareness of the fact

add a brief qualifying observation. The propositions here presented can be upset by circumstances which in a crude, first approximation may perhaps be treated as freakish but which would have to be discussed properly in any detailed analysis of these relations. The potentially upsetting circumstances are in the nature of asymmetries and of 'inferiorities' (in the sense

that the relevance of (2*b*) presupposes (3), can be found in many early presentations. In the early terminology this wrong sequence is expressed in the following way: money is wanted not for its own sake but for the sake of the things it will buy (our proposition (1)); *thus*, goods exchange for goods and money has merely the function of oil, smoothing these exchanges, or, 'money is a veil' (our proposition (2*b*)); *thus*, there cannot be too much of all goods, supply creates its own demand (our proposition (3)). This sequence is tautological because (2*b*) applies only to a comparison of full-capacity equilibria, that is, it applies only to a system to which (3) has been shown to apply. The proposition that the elasticity of demand for money is unitary expresses the same sort of tautology, since this is intended to point up an aspect of the neutrality theorem, which presupposes the validity of our proposition (3). Therefore, the curve that has unitary elasticity is a locus of demand-supply equilibria. *In no sense* is it a *demand curve*, since it plays no role whatsoever in determining equilibria. In Patinkin's doctrinal criticism this unitary-demand-elasticity proposition, which lived on well into the present century, rightly is treated as a *bête noire*.

However, Patinkin's criticism of the doctrinal development seems too severe at times, in that too little emphasis is placed on earlier statements that foreshadow (sometimes vaguely, but sometimes quite definitely) the correct relationship between the various propositions. For example, it follows quite directly from Marshall's verbal description of the cash-balance equations in ch. iv of *Money, Credit and Commerce* that with flexible wages and prices a 'real-balance effect' will not let the system come to a rest except when capacity production has been established. It is difficult to imagine that this inference should have escaped Marshall, even though he does develop the unitary-demand-elasticity proposition in Appendix C of op. cit. As for early writers, it does not take too much to read the correct logical sequence into some passages of Hume's analysis (e.g. in *Of Money*). Correct and incorrect notions lived side by side until recently, often in the works of the same writers.

Part of the explanation, it seems to me, is that no earlier writer has challenged Say's Law nearly as effectively as Keynes, and hence the typical response to earlier attacks was *not* to put the argument right (*not* to clean it up thoroughly), but to point out the serious analytical deficiencies of the attack itself. As has been argued in the text, even on the assumption of a small and interest-inelastic (generally constant) Marshallian *k*, it is easy to 'attack' Say's Law in such a way that the correct 'defence' should have to invoke price flexibility and the real-balance effect, as a prior argument to neutrality propositions. But from a very early stage on the well-known attacks on Say's Law were trying to construct a much more complex case, a case where not only more money was needed but where 'easy credit' would have been insufficient to bring the supply of money to the size required for capacity production. These were ill-constructed Keynesian cases, from the time of Malthus on, usually with the naïve implications that if the average propensity to consume is 'too low' then investors will 'of course' be discouraged from filling the gap (presumably irrespective of the conditions on which credit is available). The argument concerning the automatic adjustment mechanism was cleaned up recently, in response to the Keynesian attack itself, rather than in response to earlier analytically deficient claims that a Keynesian impasse may exist. Indeed, already Haberler's criticism of the Keynesian theory in *Prosperity and Depression* contained some of the essential elements of the subsequent Pigou-Patinkin analysis which makes Keynesian unemployment a matter of an insufficient supply of real balances due to the overpricing of goods (which in turn is caused by money-wage rigidity).

The author feels that among the early attempts to show the possibility of a Keynesian impasse, that of Thomas Chalmers, in Chap. 5 of his *Political Economy*, has quality which deserves to be mentioned here. This is because Chalmers argued that the economy could become unable to use its savings only as a consequence of a security of resources needed along with capital. Other critics of Say's Law; including Malthus, tried to establish the possibility of oversaving, regardless of the availability of resources in general (a remarkable feat for Malthus).

in which 'inferiority' is interpreted in price theory). For example, it is right to imply, as we have, that the public's liquid assets exceed the liquid claims against them; yet the negative real-balance effect on short-term debtors *may* be numerically quite different from the positive effect on owners of liquid assets. As for 'inferiority', it is conceivable, but very unlikely, that the improvement in the position of liquidity owners, when prices fall, is consummated in such a way that the commodity markets do not benefit at all (e.g. in a limiting case all could be 'taken out' by the beneficiaries in the form of additional liquidity).[1] Furthermore, we must always remember that reasoning of the kind here developed has nothing to say about the route by which equilibrium positions are reached.

C. Static Equilibrium and Paths of Shifting Equilibrium

Is our set of interrelated propositions generally applicable also to a dynamic economy, in which the supply of resources is rising and technological-organizational knowledge is increasing? Is this entire set of propositions valid along a path of 'dynamic equilibrium', that is, in circumstances where resources are growing gradually in a predictable fashion? The answer to this question, I think, is no.

When suggesting that our set of interrelated propositions is not generally applicable to a dynamic economy, I do not mean to call attention merely to the fact that these propositions are inapplicable to disturbed phases of economic development during which unexpected events play an important role. I mean to suggest that this set of propositions must be modified—when we are concerned with a path of shifting equilibria. We may assume that the characteristics of such a path of dynamic equilibrium are predictable. To be sure, in a theory relating to a monetary economy, static or, dynamic, it is necessary to leave room for uncertainty (risk premiums) even if we assume that predictions come out right. But what I am suggesting here is that our set of interrelated propositions needs to be modified for a path of shifting equilibria, regardless of how good the foresight is which we postulate for that path. We may thus postulate continuous demand-supply equilibrium at rising levels of output.

The conceptually simplest test of our set of propositions, for the kind of *static* equilibrium for which they were developed on page 6, may be described in the following way. Assume that in such equilibrium, where the absence of (net) investment opportunities is taken for granted, the monetary authority decides to reduce the supply of money to one-half of its previous size. Then these propositions tell us that (aside from temporary disturbances)[2] aggregate output and employment will stay unchanged. This

[1] This would be a borderline situation toward inferiority of goods.

[2] The temporary disturbances are disregarded in the formulation of the propositions.

must be so if Say's Law is valid in the long run. Our propositions also tell us that all other characteristics of the equilibrium will stay unchanged, except that the general price level will be lower. This must be so if money is neutral.

Let us now consider a path of dynamic equilibrium for a growing economy, with continuous demand-supply equilibrium at rising levels. The appropriate test here is the following. We compare a sequence of situations, call it Sequence I, in which the nominal money supply is increased at the rate required to keep the price level constant, with another sequence of situations in which the nominal money supply is held constant and the public is made to satisfy its rising demand for real balances through a gradual and predictable decline of the price level. In both cases we start with capacity output. In Sequence II the gradual decline of the general price level brings in the real-balance effect, the consequences of which we are testing. Will effective demand be sufficient in both sequences to maintain capacity output? This is a test of Say's Law. Provided that the answer comes out in the affirmative, will all the other 'real' characteristics of Sequence II also be identical with those of Sequence I? This is a test of the general neutrality theorem for dynamic equilibrium (i.e. for a smooth path of shifting equilibria).

When the problem is posed in this fashion, the 'institutional price-rigidities' cease to provide a fully convincing reason for arguing that practical considerations prevent us from relying on the real-balance effect. For it is quite conceivable that the expectations of the public could be geared to a policy of constant money supply and to a gradually declining price level. The 'rigidities' would still make it highly desirable to smooth out, by means of policy, the disturbances around the trends to which the public has become used, but this is a different question.[1]

For dynamic equilibrium the outcome of these tests justifies Say's Law, but it does not generally justify the neutrality theorem. Alternatively, this could also be expressed by stating that we get a different kind of Say's Law, one that is torn out of the neutrality context. The table will now assume the following form.

(1) All demand for money is demand for real balances.

(2*a*) Forces threatening to create excess supply of goods or labour generate real-balance effect if wages and prices are flexible.

(2*b*) 'Real 'characteristics of aggregative demand-supply equilibrium *do* depend on money supply (money not neutral).

(3) No excess supply of goods or labour if prices are flexible (Say's Law).

[1] It would not even be unfair to test the validity of Say's Law and of the general neutrality theorem in dynamic economics by comparing a monetary policy of price-level constancy with conditions where the money supply *contracts* at a previously announced, predictable

In this context it is necessary to take account of the effect of falling prices on the real rate of interest. I am implying here that the money rate of interest has a floor at the zero level or slightly above it. This is clearly a reasonable assumption because the difficulties of 'taxed money' schemes would be entirely prohibitive. We cannot disregard these difficulties with a reference to their 'merely institutional' character because, in the sense in which these are institutional imperfections, money itself is an institutional imperfection. If the money rate of interest cannot decline below zero, and the price level is declining at a steady rate, the real rate of interest can never be less than the rate at which the price level is declining. Even money itself earns this real rate of interest.

Assume, for example, that population, the capital stock, and technological knowledge are growing and that output tends to increase at a yearly rate of 3–4 per cent. Assume also that when the money supply is increased at a yearly rate of 4 per cent. (or perhaps somewhat more) the general price level stays constant, and that in such circumstances the money rate of interest, and also the real rate of interest, is in the neighbourhood of 3 per cent. The alternative policy of keeping the supply of nominal balances rather than the price level, constant would then result in a reduction of the general price level at an annual rate of 4 per cent. (or somewhat more). But in this case the real rate of interest would have to rise from 3 per cent. to at least 4 per cent. If at a 3 per cent. rate full-capacity savings equalled investment *ex ante*, then at a 4 per cent. rate the same propensity to save would lead to underutilization.

The possibilities which such a model opens up are complex. With a constant nominal money supply, the tendency toward oversaving or underinvestment will speed up the rate of price decline. This will further raise the real rate of interest if the conditions which we are describing now are expected to repeat themselves in each period. The initially postulated rate of increase in output could therefore be achieved, with a constant supply of money, only if a further fall in the price level encouraged investment *through the real-balance effect on investment* by more than the amount by which a further fall in the price level discouraged investment *through raising the real rate of interest*. This certainly cannot be taken for granted, and it may even be suggested that such an outcome is distinctly unlikely. If on balance they further fall in the price level discourages investment, then full utilization can be established only *if and when* the rate of price reductions hits a range where for any given real rate of interest the real balance effect

rate. However, we shall compare constancy of the price level with announced and predictable *constancy* of the money supply along the growth path. This simplifies the discussion. At one point, however, this simplification lets the monetary-neutrality theorem 'get away' too easily. This is at the end of the present section, where a contracting money supply would have much worse consequences.

encourages consumption more than investment. The resulting growth rate will be less than that which was initially assumed. By *how much* less is a question which could be answered only if all elasticity assumptions were specified in detail.

The general assumptions on which the foregoing illustration was based are not in any way eccentric. They imply no more than that the rate of increase of the labour force and the rate of increase in output per man may very well add up to more than the money rate of interest prevailing in dynamic equilibrium when the price level is kept constant.

D. Monetary-Policy Requirements of Converting the Savings Potential into Investment and Growth

We may now conclude that in the event of flexible prices Say's Law—the theorem concerning the necessary sufficiency of effective demand for full utilization—can be properly established for long-run stationary equilibrium. Indeed, Say's Law can be established even for paths of shifting equilibria (for the 'normal growth paths' of developing economies), but here not in the framework of the general neutrality theorem. Outside the monetary-neutrality framework, Say's Law is a very different sort of proposition: it means that effective demand becomes sufficient by way of a process which may first change the economy in essential respects (for example, may reduce the growth rate and thus the slope of the uptrend in the standard of living). While in many ways classical and neoclassical theory come out remarkably well in the light of recent contributions, the analysis here presented nevertheless shows that some of the basic theorems of classical equilibrium theory are not easily extended from static equilibrium to what may be called the equilibrium *paths* of growing economies.[1]

[1] The historical reason is perhaps that it took economists a long time fully to accept the idea that growth is the normal state of a Western economy. At least it took them a long time to formalize this idea. There exists an equilibrium problem in the static context and there exists a problem of shifting equilibria which is essentially an *equilibrium problem in the dynamic context*, a problem of smooth growth.

In a general way, the classical writers were certainly aware of the fact that growth is not properly regarded as a short-run disturbance of long-run stationary equilibrium. The 'advancing state of society' was not simply a problem for short-run theorizing. In fact, during the classical period proper, conceived of as the Hume-to-Mill period, this awareness of the concept of a growth path gave rise to occasional obscurity or ambiguity in the classical equilibrium analysis. The logic of the classical equilibrium theorems called for their interpretation in terms of stationary equilibrium. But all classical writers knew very well that the observable long-run tendencies were influenced by gradual growth. Hence an equilibrium theorem in the classical sense was not the same thing as a theorem about observable long-run tendencies. Hume already saw this, and so did the later classical writers. But occasionally the results of long-run equilibrium theory were supposed to become observable along the growth paths of Western economics.

Marshall made the distinction quite clear. In his presentation, a long-run equilibrium theorem required that there should be no change in the resource position of an economy while the equilibrating process was working itself out. Marshall obviously felt, however, that many significant problems in economics required looking at a path of shifting equilibria. He said so, explicitly, and he discussed problems of normal growth at some length. The

We are concerned here with a specific manifestation of the non-neutrality of money along paths of dynamic equilibrium: converting the natural saving potential of an economy into capital formation requires monetary policy in the long run. This last statement implies that the 'genuine' or 'natural' saving potential of an economy is that which develops when the general price level is kept stable, not a saving potential which for given interest rates is reduced by the real-balance effect. After all, the real-balance effect is a specifically monetary phenomenon, and money at the end is an 'imperfection', in that it must be explained by uncertainty and/or by the costs of buying and selling securities. It would be unreasonable to raise the objection here that a constant general price level is also a monetary phenomenon and that therefore the saving potential at a constant price level is no more 'natural' than a reduced potential. If the imperfections requiring the use of money did not exist, it would still be possible to *express* the 'real' results of the identical economic activity in terms of money prices, implying constant purchasing power of money; but it would not be possible to express the identical 'real' results in terms of a system where the real-balance effect changes the propensity to save.

The statement that in certain circumstances the real-balance effect of price reductions reduces the full-employment saving potential, is equivalent to the statement that in these same circumstances the 'Keynesian' type unemployment will develop when prices are not flexible (barring, of course, fiscal-policy intervention).

E. The Dangers of Price Inflation

At present Western economies are faced mainly with the dangers of inflation, not with those of an appreciable downtrend in the price level. Appreciable deflation has dangers some of which are connected with the existence of a floor to the money rate of interest, at zero if no higher. These difficulties have no counterpart for inflation. While the money rate is subject to a floor, it is not in principle subject to a ceiling. In the first approximation it is possible to describe an economy geared to a steady and appreciable rate of price inflation, a condition where dynamic equilibrium is not disturbed because the money rate includes just the right allowance

main reason for his reluctance to formalize a concept of dynamic equilibrium was, it seems to me, his conviction that it would not be useful to assume away from a dynamic framework the disturbances developing from wrong foresight. Wicksell, of course, made an important step toward formalization of the concept of moving equilibria when he defined his saving-investment equilibrium, in which net saving and net investment were positive. Other important steps in this direction were made in the nineteen-twenties, particularly in Cambridge (Robertson, Keynes) and in Sweden. However, only recently, only in the post-Keynesian period, was the concept of dynamic equilibrium sufficiently highly developed to enable us to inquire in each case what the equivalent of a static equilibrium theorem is in a framework where continuous demand-supply equilibrium is assumed at rising levels. This stage of development was started off by Harrod's contribution in 1939.

for the correctly foreseen rate of price increases. We said this was possible 'in the first approximation' because some difficulties would nevertheless arise in these circumstances, as a consequence of institutional factors, particularly in consequence of our inability to let hand-to-hand currency earn interest. It would also be awkward to introduce interest payments on all the 'deferred payments' which habitually do not carry such charges; and awkwardnesses would develop even in connexion with the introduction of interest payments on check deposits, especially the deposits that are turned over rather rapidly. These difficulties exist at any event, but they weigh less heavily when the money rate is low than when it is high. Aside from these difficulties, it is possible to describe a condition where the economy is smoothly geared to any given rate of price inflation.

However, the measures by which a government could assure a steady rate of price inflation, are precisely the same as by which it could assure stability of the general price level. Once this is recognized, price-level stability becomes the superior objective, if for no other reason, then because of the difficulties just considered.

When the problem is reduced to 'fundamentals' there exist only two methods by which the inflationary tendencies with which Western economies are faced could be suppressed. One method is to tie the full-employment objective to a price-level clause. Crudely expressed, this means a promise on the part of the monetary-fiscal authority to aim 'next year' at the effective demand required for 'next year's' capacity output when that output is valued at 'this year's' price level (in some countries presumably with an allowance for changes in import prices, and perhaps for some other factors). In essence this is a policy of 'maximum output consistent with a general price-level objective', a policy that becomes counter-inflationary when the price-level objective is transcended. There is no advantage in tilting the price-level target upward, rather than aiming at a stable price level. Contractionary monetary-fiscal measures would then become the penalty of cost inflation. The policy would prove successful (without paying an undue price for its success) if, perhaps after an initial interval required for adjusting modes of behaviour, the forces making for cost inflation could be made to give way at high levels of employment.

What is a 'sufficiently high level' will remain a matter of political judgement, but the policy does have the advantage of not calling for interference with the wage and price structure. The only other alternative—that of wage regulations—does involve such interferences which in turn imply interferences with the price structure. The advantage might be fuller employment, but the cost is very high indeed. If a political community wishes to incur this cost—the cost of moving outside the context of the market economy in very essential respects—then again there is no

advantage in aiming at a steady rate of inflation rather than at a stable price level. Indeed, governments are not aiming at steady rates of price inflation.

The reasons for the observable inflationary tendencies are of different character. Both methods of getting the price trend under control are uncomfortable, and the temptation is strong to work toward the demand required for capacity output with *no* price-level clause attached to the policy. This creates instability upward even where the government finds it possible to avoid fiscal deficits. In such circumstances the likelihood of an acceleration of the rate of inflation becomes substantial. This is now being increasingly realized in the countries of the Western world, and there are some signs of a will to cope with the problem.

However, price-level stability does obviously not *in itself* assure full utilization or growth. A stationary economy with full utilization might very well have a stable price level. Even a severely underemployed economy might, provided money wage rates are kept rigid in such an economy.

F. The Strategic Significance of Innovations

The high performance of Western economies should presumably be explained with particular emphasis on innovations, that is, on what may be called the improvement mechanism.

To be sure, it is not possible scientifically to disprove the claim of some economists that in the main we are the beneficiaries of the balanced-budget multiplier. On certain simplifying assumptions, tax-financed government expenditure on goods and services, which have been high since the war, cause a net addition of equal size to the aggregate demand for goods.[1] In other words, on these simplifying assumptions, the multiplier to be applied to tax-financed government expenditures is *one*. But the theorem assumes among other things that taxation reduces demand *only* by leaving taxpayers with less spendable income, and not at all by reducing the incentives of investors. Given the tax structures of Western economies, this seems very unrealistic, although it is impossible to make quantitative allowances for disincentive effects.[2] The fact remains that contemporary taxation strongly reduces the net gain obtainable when an investment project succeeds, without reducing nearly to the same extent the loss that is suffered when a project fails. The balanced budget multiplier theorem

[1] This is essentially because the government 'pays back', to those from whom it buys goods and services, the disposable income of which it takes out of the stream by means of taxation. Thus, disposable income and the private demand for goods remain unchanged and the demand for goods coming from the government is a net addition. Among other things it is assumed by the theorem that taxation does not reduce private investment through disincentive effects.

[2] This is true notwithstanding the loss-deduction clauses in tax laws.

moves on shaky grounds, in the sense that, with allowances for disincentive effects, the value of this multiplier may turn out to be much less than one (or even negative); and trends in aggregate demand have recently been strong, by a safe margin.

The fact that trends in aggregate demand have recently been strong by a safe margin reduces the plausibility also of the proposition that the sufficiency of effective demand is mainly a consequence of a smaller savings-to-output ratios. In the present age it does certainly not seem that somewhat higher savings would cause deflationary difficulties; and while typical savings-to-output ratios have recently been smaller than in many decades of the past the absolute amount of savings (in constant prices) has in general shown a rising trend.

These considerations direct one's attention toward the continued profitability of private investment, and thus to offsets to diminishing returns. With the capital stock rising at an appreciably higher proportionate rate than the supply of other resources, there is a 'tendency' of yields to decline toward a floor determined by risk-premium requirements. On a given level of technological-organizational knowledge this process would by now probably be completed, and from there on easy credit would not be sufficient to keep the growth process going. What conditions must the improvement mechanism meet in order to serve as an effective offset?

G. Innovational Requirements

To perform as adequate offsets to diminishing returns to investors, innovations must be sufficiently plentiful and not too strongly 'relatively capital-saving'. Keynes may be interpreted as having been pessimistic with respect to the ability of the system to meet this requirement. On the other hand, if the innovations became too little 'relatively capital-saving' (too strongly 'relatively labour-saving') they would cause either unfavourable wage trends, or, in the event of a wage floor, the kind of 'non-Keynesian' unemployment which is attributable to the demand for labour being insufficient at *given* wage rates and with the given capital stock. In this case the capital stock would become too small relative to the labour supply, and its physical character would be such as to make it too little labour-using.

If O stands for output, V for the capital stock, P for interest-plus-profit income, then we may formulate the following identity.

$$\frac{O}{V} \cdot \frac{P}{O} = \frac{P}{V}.$$

The first term on the left-hand side is the average productivity of capital; the second term the share of interest-plus-profit in the aggregate income; and the term on the right-hand side is the rate of return on capital.

Given the path of resource-inputs for the economy as a whole, trends in O/V will be the more favourable (the less downward tilted or the more upward tilted), the more plentiful the innovations are.[1] The trends in P/O will be the less favourable for investors (these trends will be the more downward tilted or the less upward tilted) the more 'relatively capital-saving' the innovations are. The wireless was obviously a very strongly 'relatively capital-saving' innovation; automation devices are strongly 'relatively labour-saving'.

In any specific development of these ideas and in any analysis of the record we must use functional relations rather than identities. In the subsequent pages the marginal productivity theory will be employed, but it would be possible to fill the framework set by the foregoing definitions and identities by other theories. The marginal productivity theory expresses a broad motivational principle (profit-maximization), and it is based on the assumption that in long-run analysis the relevant functions may be treated as if they were continuous. This does not seem a bad first approximation, although it would of course be preferable to have more specific theories of investment and of distribution. These would presumably have to be in the nature of testable econometric relations between investment and income distribution on the one hand, and other measurable quantities on the other. We do not at present possess satisfactory relations of this sort.

Later we shall return to these methodological difficulties and we shall raise the question of how strongly the results of the analysis are affected by them.

In the graph that follows a pair of productivity functions—an average and a marginal productivity function—applies at the time when the capital stock is V_1, and another pair applies at the later time when the capital stock is V_2. Since the capital stock is assumed to increase relative to the supply of other factors of production, the upward shift of the functions is a consequence of technological-organizational improvements (innovations). These improvements have counteracted the declining tendency of rates of return to investors, although here we intend to describe a situation with a small decline in rates of return.

The fact that rates of return have declined but a little must be explained in part by the elevation of the level of the average productivity (or of the total productivity) of capital for any given capital input. The percentage elevation of the *average* productivity (or of the total productivity) for a given input (say, for V_1 or for V_2) may be defined as the *quantity* of innovating activity. But the trend in the marginal productivity is not determined by the percentage elevation of the average productivity alone. It is determined by this *and* by what happens to the percentage gap between the

[1] Alternatively expressed: the greater their overall strength is.

average and the marginal productivity. This is a matter of how 'relatively capital-saving' (versus 'relatively land-labour-saving') the innovations are. The percentage gap between the average and the marginal productivity is that share of aggregate income consisting of incomes other than interest-plus-profit; thus the percentage gap in question is uniquely related to the P/O term on page 196, *supra*.

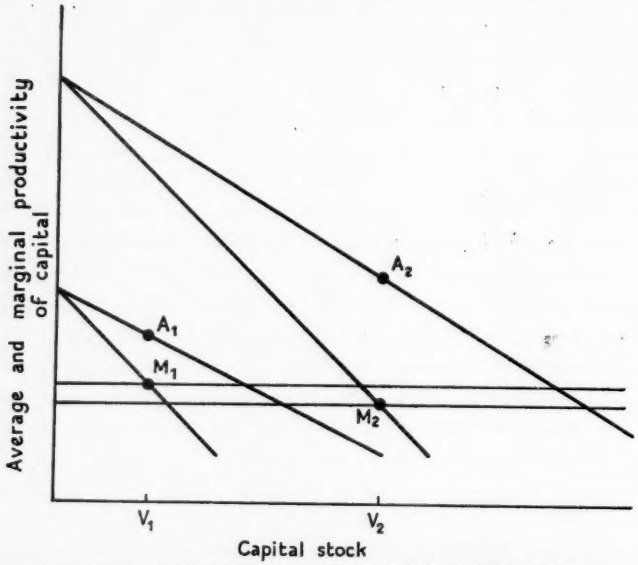


FIG. 1. Joint effect of Innovations and of Capital Formation. (Observed magnitudes are output and rates of return when capital stock is V_1 and V_2, respectively.)

H. Relatively Capital-saving: As Compared to What?

In our graph the percentage gap between the average and the marginal productivity is greater at V_2 than at V_1. If this were not so, then, with the same quantity of innovating activity, not even a small decline in the marginal productivity would have taken place. On the contrary, the marginal productivity would have shown a rising trend. Given the quantity of innovating activity, trends in the rate of return on investment will be the more favourable, the less the innovations widen the percentage gap between the average and the marginal productivity of capital or the more they narrow this gap. On the other hand, given the effect of the innovations on the percentage gap between the average and the marginal productivity of capital, trends in the rate of return on investment will be the more favourable, the greater is the quantity of innovating activity as expressed by trends in average productivity.

It is reasonable to call innovations the *more* 'relatively capital-saving', that is to say, the *less* 'relatively labour-land-saving', the *more* they widen the percentage gap between the average and the marginal productivity of capital. An innovation that greatly widens this gap has a high 'relative capital-saving effect' and a low 'relative labour-land-saving effect'; an innovation that narrows the percentage gap between the average and the marginal productivity of capital has a low 'relative capital-saving effect' and a high 'relative labour-land-saving effect'. But in this connexion it is important to remember a difficulty which is frequently overlooked in the analysis of these problems. Even if we do not know the precise characteristics of the production functions, it is very useful to be equipped with the concept of an array of possible innovations. Such an array moves from innovations with a high relative capital-saving effect (low relative labour-land-saving effect) to innovations with a low relative capital-saving effect (high relative labour-land-saving effect). Within such an array we may make comparisons as between different innovations. It is much less useful to speak of innovations which are relatively capital-saving *rather than* labour-land-saving or of innovations which are relatively labour-land-saving *rather than* capital-saving. This conception implies comparisons of the various factor-saving effects of given innovations, comparisons which require more information about the production functions than we usually have. Our graph illustrates the point.

A graph of this sort must be drawn on the basis of observations which are made in two distinct periods, where during the first period the average capital stock is V_1, the output is $A_1 \times V_1$ and the rate of return on investment is M_1, while the analogous magnitudes for the second period are V_2, $A_2 \times V_2$, and M_2. If we trust certain crude statistical measurements and the marginal productivity theory, then the average and marginal magnitudes on the lower functions are observable for the input V_1, and the same magnitudes on the higher functions are observable for the input V_2. But these magnitudes are never directly observable on both sets of functions for the same input. Consequently, very little reliance can be placed on speculations concerning the nature or the size of the effect of these innovations on the average-marginal gap for any given input of resources (e.g. for the capital input V_1). If we trust our measurements and the marginal productivity theory, we may conclude, for example, that the average-marginal gap is greater in V_2 than in V_1. That is to say, we may have observed that the relative share of capital is smaller in V_2 than in V_1. But unless the behaviour of the gap (i.e. of the distributive shares) *along* the functions themselves is known, we do not know *why* the gap is greater in V_2 than in V_1. The gap may be greater because the innovations have increased the gap, in which case they were 'relatively capital-saving' *rather than* labour-

land-saving; but the gap may be greater in V_2 than in V_1 merely because a movement *along* these pairs of functions from V_1 to V_2 increase the gap, or because the 'product-mix' changed from, say, more steel-making (where the gap is relatively small for capital) to say, more laundering (where the gap is greater for capital).

In other words, we usually cannot tell whether the innovations were relatively capital-saving *rather than* labour-land-saving, or vice versa; and yet it *is* possible to conclude that the innovations were just enough 'relatively capital-saving' to have resulted in the observable trends in rates of return and in real wages, when the rate of capital formation, the rate of increase in the labour supply, the characteristics of the production functions, the trends in the composition of output, *and the quantity of innovating activity* (i.e. the percentage elevation of the average productivity functions) are taken for granted.

For example, in the situation illustrated by our graph we do know that, other things equal, we would have obtained a horizontal or an upward trend in rates of return if the innovations had had a smaller 'relative capital-saving effect' and a greater 'relative labour-land-saving effect' that they actually had. Given the quantity of innovating activity, as measured by the upward shift of the average productivities for given inputs, the innovations of the graph were just enough 'relatively capital-saving' to result in a small decline in rates of return on investment. More 'relatively capital-saving' innovations (more innovations of the 'wireless' type) would have resulted in a greater reduction of rates of return, less 'relatively capital-saving' innovations (more innovations of the 'automation devices' type) might have led to a rise of rates of return, given the quantity of innovating activity. We may conclude also that with an even greater quantity of innovating activity than that which took place (with an even greater upward shift of the average or total productivity functions), the *actual* distribution of the relative factor-saving effects would have resulted in a horizontal trend or in an uptrend in rates of return. Indeed, in the event of a greater quantity of innovations, the more favourable trends in rates of return would have been compatible with the same trends in other factor earnings as were actually observable, while a change in the relative factor-saving effects benefits one factor at the expense of the other.

These statements make use of the concept of an array of innovations moving from the more to the less 'relatively capital-saving', that is, from the less to the more 'relatively labour-land-saving'. The concept of such an array is very useful in our attempts to discover whether the innovations were sufficiently plentiful and sufficiently 'relatively capital-saving' (or labour-saving or land-saving) to achieve certain results, when the unidentified production functions and the trends in the product mix are taken

for granted. But we can make no dependable statement on whether the innovations were relatively capital-saving *rather than* labour-land-saving or vice versa.[1]

As was already said, changes in the composition of output enter here importantly because of the fact that the functions of our graph on page 198 are different for different 'industries'. Obviously, the gap between the average and the marginal productivity of capital is *smaller* (the corresponding gap for labour is *greater*) in a capital-intensive activity, such as steel manufacturing, than in labour-intensive activities, such as retailing or laundering. Thus, changes in the composition of output have a marked effect on the observable trends in the average and the marginal productivities of the various factors of production. Innovations which were not too 'relatively capital-saving', in the sense of not having resulted in a significant lowering of rates of return, would have been too 'relatively capital-saving' if the weight of capital-intensive activities had become smaller than has been the case; on the other hand, the same innovations might have been too 'relatively labour-saving' if the weight of labour-intensive activities had been smaller. In the latter case these same innovations might have resulted in adverse trends in real wage rates, or in the 'non-Keynesian' type of unemployment which may well exist in some under-developed countries and which was mentioned earlier in this article.

Changes in the composition of output could in principle invalidate even the statement that the failure of the average productivity of capital to decline is a consequence of innovations. It will be seen presently that at least for the United States this qualification is unimportant.

I. The Record

The general record of Western industrial societies shows that the quantity of innovating activity has so far stayed high enough to prevent the average productivity of capital from falling (i.e. the average capital-output ration from rising). The average productivity of capital is more likely to have risen in the long run. This has been the result even though the supply of capital has been rising at an appreciably greater proportionate rate than the supply of the other factors, that is to say, even though the average degree of capital-intensity of our activities has been rising. It follows, of course, that the average productivities of the other resources have been rising significantly. At the same time, the innovations have not been so strongly 'relatively capital-saving' as to result in any *appreciable* lowering of rates of return to investors, and they have not been so strongly

[1] In his recent article in the *Review of Economics and Statistics* (op. cit.), R. A. Solow suggested a method of circumventing this difficulty in certain circumstances.

'relatively labour-saving' as to prevent a significant uptrend in real wage rates.

There may well have occurred a small secular lowering of rates of return to investors before taxes.[1] Given all other circumstances, this may be attributed to the fact that the innovations have been somewhat too 'relatively capital-saving' (somewhat insufficiently 'relatively labour-saving') fully to maintain rates of return at their earlier levels. Thus, we may have been moving in the neighbourhood of the danger zone of insufficient labour-saving effects, i.e. of too high 'relative capital-saving effects'. But it seems to me that unless there occurs a break in the general trend of development, we do not have to fear any sweeping or consistent reduction in rates of return, such as would block the conversion of Western saving potentials into capital formation and growth.

If the failure of the average productivity of capital to decline had been the consequence of changes in the composition of output from capital-intensive to labour-intensive industries, then distributive shares would have had to change *very significantly* to the disadvantage of investors. This has not taken place, and crude estimates relating to individual sectors also indicate that innovations rather than these shifts explain the favourable trends in average productivity.

J. Dependence of the Results on the Measurement of Capital

This statement must, however, be qualified by considerations to which, on balance, we are inclined to attribute somewhat less importance than some economists do, although the matter is legitimately controversial.

The reasoning here implied the measurability of 'capital' as a general factor of production. The quantitative statements of the reasoning were based on the now conventional idea that capital can be measured usefully by expressing the value of the existing capital goods at their cost of acquisition by the investor, with correction for price changes. This is logically unsatisfactory for several reasons, mainly because of the continuously changing physical character of the capital goods whose prices are to be 'kept constant'.

Important features of the analytical tools we have been using here originated in the early work of Hicks, Harrod, and Mrs. Robinson. These tools imply measurement of capital as a general factor. Recently, however,

[1] Assuming that business taxes are capitalized, we should compute the rate of return on the market value of securities after these taxes, but the rate of return on the cost of capital goods before these taxes. If the tax were reduced, the rate after tax on market values would stay unchanged and the rate before tax on the cost of capital goods also would, for the unchanging amount of investment. This situation would tend to generate increased investment, but we are trying to measure the rates of return on the actually observable amount of investment in such a way as to eliminate, so far as possible, the effect of the taxes.

Mrs. Robinson has placed considerable emphasis on the limitations of all measurements of 'capital' as a general factor of production.

These objections possess logical validity. But what matters from our point of view is that in the long run the price and wage system of Western economies has directed capital formation into the required specific channels effectively enough *not to make it pragmatically misleading* to treat capital as a general factor of production and to measure it by the cost of production of capital goods in so-called 'constant prices'. A model based on such a conception cannot satisfy the logical purist, but this is not what matters ultimately. Circumstances are conceivable in which the model would yield unrealistic results and this, of course, *would* matter. Rigidities in the structure of the specific goods of which 'capital' consists *might have* come to dominate the trend of events; or the rate of change in the physical character of capital goods *might have* become so rapid as to deprive the national-income analyst of all means of so-called price correction. If we try to explain *why* these things might have happened or *why* they have not happened, the concept of capital as a measurable general factor of production is question-begging; if we take it for granted that these things have not happened, the objections become much less weighty. The conclusions accord with common observation *in their main outline*, and this suggests that we may pay some attention even to results concerning details such as have no very precise counterpart in common observation.

K. Conclusion

The main results of the reasoning were that the 'capital stock' has been rising at a higher rate than the labour supply; that at a given level of technological knowledge this would have gradually led to a significant lowering of rates of return; that innovations have been sufficiently plentiful to keep the average productivity of capital from falling; and probably sufficiently plentiful to cause a rise in the average productivity capital in the individual sectors; and that the mild lowering of rates of return that may be observable should therefore be attributed to a decline in the share of investors in the national income, i.e. to a somewhat smaller 'relative labour-saving effect' of the innovations than would have been required to prevent even a mild fall in rates of return. It seems to me reasonable to accept these conclusions in spite of the logical shortcomings of the concept of the 'quantity of capital'.

Had these conditions not been satisfied, Western economies would not have been capable of converting their full saving potential into capital formation and growth within the framework of their market processes. The rate of return on investment would have gradually fallen below the required level of risk premiums. The consequence would have been either

unemployment of the kind which develops when saving exceeds investment at full employment ('Keynesian' unemployment); or absorption of savings by public investment of a sort which, aside from these difficulties, would not have been considered desirable; or, reduction of the saving potential by government transfer payments; or, in the event of *price flexibility, the destruction of part of the saving potential by the Pigou effect.* If, on the other hand, the character of innovating activity had become *much* more 'relatively labour-saving' than has been the case, we would have obtained a marked uptrend in rates of return, but wage trends would have become unfavourable. In fact the character of innovating activity has adjusted to the requirements of Western economies reasonably well. Since innovating activity has come to be based on increasingly systematic and directed effort, an adjustment mechanism may very well be at work here.

The conclusions as here formulated, do not take account of the possibility that the main sweep of events was dominated by changes in the monopoly power of producers. This seems unlikely, because one of the results of empirical investigations is that trends in rates of return on the cost of capital goods have been less favourable than trends in the average productivity of capital. These rates of return include monopoly rents, the relative weight of which is unlikely to have declined appreciably.[1]

The conclusions also disregard the possibility that trends in the distributive shares should be interpreted with emphasis on the effects of unionism. In the United States, at least, distributive trends have not been more favourable for labour prior to the nineteen-thirties, when unions were weak, than since that time when they have been very strong. Such observations, and others to which we could refer here, do of course not in themselves disprove alternative hypotheses. But, it seems likely that money-wage increases, such as might not take place in a competitive labour market, express themselves in good part in price increases. Possibly, they express themselves in part also in a more 'relatively labour-saving' character of innovations.

[1] More cautiously expressed: the trends in rates of return have certainly not been more favourable than trends in the average productivity of capital. The favourable trends in average productivity are presumably technologically determined, and it would be implausible to explain the fact that trends in rates of return (including monopoly rent), have, if anything, tended to be weaker with primary emphasis on trends in monopoly power.

AN INTEGRATION OF EMPLOYMENT ECONOMICS WITHIN THE KEYNESIAN THEORY OF MONEY FLOWS

By H. VANDENBORRE

KEYNES has defined the Aggregate Demand Function D as a macro-economic relationship between employment opportunities supplied by the entrepreneurs and their expected proceeds, while he describes the Aggregate Supply Curve Z as a relationship between employment and the corresponding supply price of aggregate output.

It has been argued or tacitly assumed, in post-Keynesian writings, that there does not exist any fundamental difference between this pair of curves and the nowadays widely known 45° diagram, which presents the equation of income and aggregate spending (viz. the equation of saving and investment) as a condition for equilibrium. In this paper it will, however, be shown that this identification is not legitimate, and that the so-called Keynesian Aggregate Functions, as well as the propensity to spend and the liquidity preference, play a definite role in explaining which forces keep the circular flow of money income and macro-economic spending steadily running. Our aim will be, in other words, to develop a synthesis of the employment theory, as summarized on pp. 25 and 55 of the *General Theory*, and the 'generalized' version of the Keynesian system given by J. R. Hicks.†

On the basis of this analysis we shall attempt to dissipate a number of confusions and to provide a constructive contribution to recent and earlier discussions.

The general assumptions will be: perfect competition (except for the supply of labour), a given level of money wages, a given quantity of money, and further the usual short-period assumptions of a given technique and equipment.

I. The Transformation of Consumer Spending and Investment into Factor Income

(*a*) *The Equilibrium of the Individual Employer*

Let p be the expected market price of a manufactured product in a given firm, $q(n)$ output considered as a function of employment n, and $pq(n)$ the corresponding expected sales receipts. From the returns $pq(n)$ the

† J. R. Hicks, 'Keynes and the Classics', *Readings in the Theory of Income Distribution*, pp. 461–76.

entrepreneur has to deduct the factor costs (wages, interest, rent), the value of the intermediate goods to be used for the production of output $q(n)$, and the depreciation of capital. The remainder constitutes his expected profits.

Assume the factor costs f to be linear, so as to have $f = wn+k$, where w denotes the given wage rate, n employment, and k the fixed factor costs. Assume furthermore for simplification, that the value of the intermediate goods needed for the production of output $q(n)$ as well as the capital depreciation are functions of the price p and employment n, and that the sum of both these components of production cost may be denoted by $pg(n)$.†

The adopted symbols lead us to write:

$$pq(n) = (wn+k)+pg(n)+\pi,$$

with π representing profit expectations.

By separating profit and factor costs‡ in the right-hand member it follows that:

$$pq(n)-pg(n) = (wn+k)+\pi, \quad \text{or} \quad py(n) = (wn+k)+\pi. \qquad (1a)$$

According to the Keynesian terminology, $py(n)$ will be referred to by the expression 'expected entrepreneurial proceeds'. The corresponding distribution of the factor income,§ as seen by the entrepreneur, is shown by $(wn+k)+\pi$.

Employers act in a way such as to keep their profit expectations optimal. The profit function $\pi = py(n)-(wn+k)$ has a maximum when

$$\frac{\partial \pi}{\partial n} = py'(n)-w = 0, \quad \text{and} \quad \frac{\partial^2 \pi}{\partial n^2} < 0.$$

From the equilibrium equation $py'(n) = w$ it appears that, in order to secure optimal profits, the entrepreneurs equate expected marginal proceeds (in the Keynesian sense) to marginal factor cost.‖

The equivalent expression $\dfrac{w}{y'(n)} = p$ shows the nivellation of marginal

† Technology and equipment being given, it may, under sufficiently abstract conditions, be assumed, that the replacement cost of a capital good varies with the price of its product, and that wear and tear depend on the number of man hours of work.

‡ By factor *costs* we mean: wages, rent, and interest. Rent and interest are assumed to be a part of the fixed factor cost k.

§ Factor *income* includes factor costs and profits.

‖ *The General Theory*, p. 55.

unit cost and marginal returns, or the equation of the supply and demand price per unit of output.†

This is the well-known Marshallian explanation of the equilibrium of the entrepreneur, with this specification, however, that marginal cost is not expressed as a function of output, but as a function of employment.

A completely equivalent proposition, of course, is that producers equate the supply price of $q(n)$ units of output to the corresponding demand price. Entrepreneurs, in other words, maximize their expected profits, by equating output valued at marginal cost (total supply price) to output valued at the expected market price (monetary demand as seen by the sellers).

This not so common formulation of the marginal principle is expressed by the condition:

$$\frac{w}{y'(n)}q(n) = pq(n).$$

In the next paragraph it will be shown that Keynes, in his famous *DZ*-equation on p. 25 of the *General Theory*, transposes the above analysis to the behaviour of entrepreneurs as a whole and, in this way, explains the transformation of given expenditures on consumption and investment into factor income.

(*b*) *The Aggregate Equilibrium of Employers*

The aggregation of equation (1*a*) over the whole of the producing units, leads to the macro-economic relationship:

$$\sum p_i y_i(n_i) = w \sum n_i + \sum k_i + \sum \pi_i,‡$$

or

$$\sum p_i y_i(n_i) = wN + K + \Pi. \qquad (2a)$$

The left-hand member of this equation, which for brevity will be denoted by D, represents the aggregate of expected entrepreneurial proceeds, whereas the right-hand side shows the corresponding distribution of factor income as seen by the employers.

In our view, D corresponds to Keynes's so-called 'Aggregate Demand Curve'. In spite of its denomination it is clear indeed that this function, as defined on p. 25 of the *General Theory*, cannot be considered as the

† This is easily shown as follows:

Total cost of output $q(n)$ is: $(wn+k)+pg(n)$.

Cost of the marginal product $q'(n)$: $w+pg'(n)$.

Marginal unit cost: $\dfrac{w+pg'(n)}{q'(n)}$.

Equality of marginal returns and marginal unit cost:

$$p = \frac{w+pg'(n)}{q'(n)}, \qquad pq'(n)-pg'(n) = w, \qquad py'(n) = w, \qquad p = \frac{w}{y'(n)}.$$

‡ The wage level is assumed to be a datum.

aggregate of the demand curves of the consumers and investors. When Keynes states: '. . . let D be the proceeds which entrepreneurs expect to receive from the employment of N men, the relationship between D and N being written $D = f(N)$,† he clearly takes the point of view of the entrepreneurs.

To distinguish D from macro-economic monetary demand proper (E), which relates to planned consumption and investment, we shall refer to D by one of the expressions 'monetary demand as seen by the sellers', 'output valued at market prices', or 'curve of expected entrepreneurial proceeds'.

Intended macro-economic profits Π, in equation (2*a*), reach their maximum when

$$\frac{\partial \Pi}{\partial N} = 0 \quad \text{and} \quad \frac{\partial^2 \Pi}{\partial N^2} < 0.$$

The first condition takes the form:

$$\frac{\partial \Pi}{\partial N} = \sum p_i y_i'(n_i) \frac{dn_i}{dN} - w = 0. \tag{3a}$$

If the individual employers maintain their equilibrium position, they realize, as shown earlier, the equation:

$$p_i y_i'(n_i) = w.$$

From substituting $p_i y_i'(n_i)$ by w in (3*a*) it follows:

$$\frac{\partial \Pi}{\partial N} = w \sum \frac{dn_i}{dN} - w$$

and, since $\sum n_i = N$, $\qquad \frac{\partial \Pi}{\partial N} = w - w = 0.$

Thus the marginal theory, already developed for the individual entrepreneur, is applicable to producers as a whole, if employment in each firm is functionally related to total employment and if every employer maximizes his expected profits.

To facilitate the further development let us assume that the price expectations of entrepreneurs depend on actual market prices and that the latter may be expressed as linear functions of the general price level P, in a way such as to have:

$$D = \sum p_i y_i(n_i) = P.Q(N).$$

Hence, equation (2*a*) may be written:

$$P.Q(N) = wN + K + \Pi. \tag{4a}$$

† *The General Theory*, p. 25.

Equation (3*a*), which expresses the aggregate equilibrium of employers, then takes the form:

$$\frac{\partial \Pi}{\partial N} = P.Q'(N) - w = 0 \quad \text{with} \quad \frac{\partial^2 \Pi}{\partial N^2} < 0.$$

This equilibrium condition lends itself to various alternative but equivalent formulations:

Producers as a whole equate marginal macro-economic proceeds (in the Keynesian sense) to marginal factor cost:†

$$P.Q'(N) = w. \tag{5a}$$

For purposes of profit maximization the macro-economic marginal production cost is equated to the price level:

$$\frac{w}{Q'(N)} = P.$$

Profit expectations are optimal when entrepreneurs equate output valued at marginal cost (Aggregate Supply Price) to output valued at market prices (Aggregate Demand Price as seen by the Sellers):

$$\frac{w}{Q'(N)} . Q(N) = P.Q(N). \tag{6a}$$

The right-hand member of equation (6*a*) represents the Aggregate Demand Function D, as defined on pp. 25 and 55 of the *General Theory*. The left-hand side corresponds to the definition: 'Let Z be the aggregate supply price of the output from employing N men, the relationship between Z and N being written $Z = \Phi(N)$, which can be called the *Aggregate Supply Function*.'‡

From comparing (5*a*) to (6*a*) it appears that the equilibrium condition (6*a*), which for brevity will be called the DZ-equation, and which Keynes explains on pp. 25 and 55 of the *General Theory*, has the same marginal content as the principle 'macro-economic marginal proceeds are equal to marginal factor cost'§ or (under appropriate assumptions) 'the wage is equal to the marginal product of labour'.‖

It need not to be stressed that this way of interpreting the DZ equation is fundamentally different from the traditional point of view which Professor F. J. De Jong formulates as follows: 'Keynes's analysis on pp. 24, 25, ..., comes exactly to the same thing as the nowadays widely known graphical analysis by means of the 45° line.'††

The 45° diagram shows the equation of planned consumption and in-

† *The General Theory*, p. 55.
‡ Ibid., p. 25. § Ibid., p. 55. ‖ Ibid., p. 5.
†† F. J. De Jong, 'Supply Functions in Keynesian Economics', *The Economic Journal*, March 1954, vol. lxiv, pp. 19–20.

vestment (E), on one side, and income earned by the factors of production (Y) on the other. This is not a DZ- but a YE- or savings-investment equation.

To show another important property of the Aggregate Supply Function Z, let us substitute the price level P, in formula (4a), by its profit maximizing value $\frac{w}{Q'(N)}$, and then put the equality under the form:

$$\frac{w}{Q'(N)} \cdot Q(N) = (wN+K)+\Pi_{\max}.$$

Expression $Z = \frac{w}{Q'(N)} \cdot Q(N)$ thus represents, at the same time, the supply price of output as a whole and the profit maximizing combination of factor revenues (profit, wages, rent, and interest), for every value of employment N.

In other words the DZ equation is the equilibrium condition of the employers acting on one side as valuators of effective demand and on the other as producers and distributors of factor income.

No wonder that the so-called Keynesian Aggregate Demand and Supply Curves, after having been analysed on pp. 25 and 55 of the *General Theory* recede to the background until chapter 20, book v. When the transformation process of given consumption and investment outlays into factor income has been explained by means of monetary demand as seen by the sellers (D) and the macro-economic supply function (Z), it remains indeed to be shown how and to which degree, income thus earned, will again be transformed into consumer spending and investment. This problem of course takes the major part of the *General Theory* and constitutes the matter of books iii† and iv.‡

II. The Transformation of Factor Income into Consumer and Investment Spending

Since Keynes has brilliantly treated this subject in books iii and iv, our comment will be very brief.

Let the factor income be denoted by Y, the rate of interest by r, consumption by C, investment by I, and the sum of C and I by E, all these variables being considered as intended or expected values.

Facing their income Y and their accumulated savings, the economic subjects may be induced to take decisions of consumption, hoarding or dishoarding, buying or selling physical assets, bonds, or shares.§

† The Propensity to Consume. ‡ The Inducement to Invest.

§ For further comments, see, for example: M. F. Timlin, *Keynesian Economics*, pp. 27 ff; J. M. Keynes, 'The Theory of the Rate of Interest', *Readings in the Theory of Income Distribution*, pp. 418–24; F. Modigliani, 'Liquidity Preference and the Theory of Interest and Money', *Readings in Monetary Theory*, pp. 186–239.

As a result monetary demand for consumption and investment will emerge and income will be consumed or saved. In the event of consumption exceeding income, dissavings will take place.

To denote the demand creating effect of these economic plans, Keynes uses the propensity to spend $E = E(Y,r)$, being the sum of the propensity to consume and the inducement to invest, with $\frac{\partial E}{\partial Y} > 0$ and $\frac{\partial E}{\partial r} < 0$.

But, in order to carry out their decisions, consumers, savers (dissavers), and employers need money. If M represents the given quantity of money, and if the aggregate demand for money in view of transaction, precaution, and speculation, is denoted by $L(Y,r)$, the way money is used in the system is described by equation $M = L(Y,r)$, with $\frac{\partial L}{\partial Y} > 0$ and $\frac{\partial L}{\partial r} < 0$.

Hence the transformation process of factor income (Y) into macro-economic consumption and investment (E) may be represented as follows:

$E = E(Y,r)$ (the propensity to spend),

$M = L(Y,r)$ (the ML equation or the equation of money supply and demand),

$$\frac{\partial E}{\partial Y} > 0; \quad \frac{\partial E}{\partial r} < 0; \quad \frac{\partial L}{\partial Y} > 0; \quad \frac{\partial L}{\partial r} < 0.$$

For every given value of Y, below a maximum depending on the ML equation, this system indeed has a determinate solution in r and E.

III. The Circular Flow of Macro-Economic Spending (E), Earning the Entrepreneurial Proceeds (D), Rewarding the Production Factors (Z), and Disposing of the Factor Income (Y)

We first studied the role of employers in transforming expenditures on consumption and investment into factor income. Then, the other way around, we briefly analysed the transformation of income into macro-economic spending. We now have to integrate both processes into a determinate system of money flows.

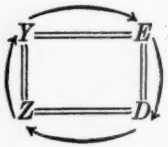
This will easily be done by assembling the elements of our model as follows:

Model 1

$E = E(Y,r)$	(Propensity to spend, planned consumption and investment or aggregate monetary demand proper.) (1*b*)
$D = P.Q(N)$	(Production valued at market prices, monetary demand as seen by the sellers or curve of expected entrepreneurial proceeds.) (2*b*)

$Z = \frac{w}{Q'(N)} Q(N)$ (Production valued at marginal cost, aggregate monetary supply function, or curve of profit maximizing factor income.) (3*b*)

$M = L(Y, r)$ (Equation of the given quantity of money and money needed for transaction, precaution, and speculation.) (4*b*)



(Equation of planned and observable consumption and investment E, expected and observable entrepreneurial proceeds D, planned and observable payments to the factors of production Z, expected and earned factor income Y.) (5*b*)

Under the Keynesian assumptions of a given wage level and a given quantity of money, the above system is determinate. Expressions (1*b*), (2*b*), (3*b*), and the right-hand member of (4*b*) are behaviour functions; (4*b*) and group (5*b*) express the conditions for equilibrium, viz. the $M = L$

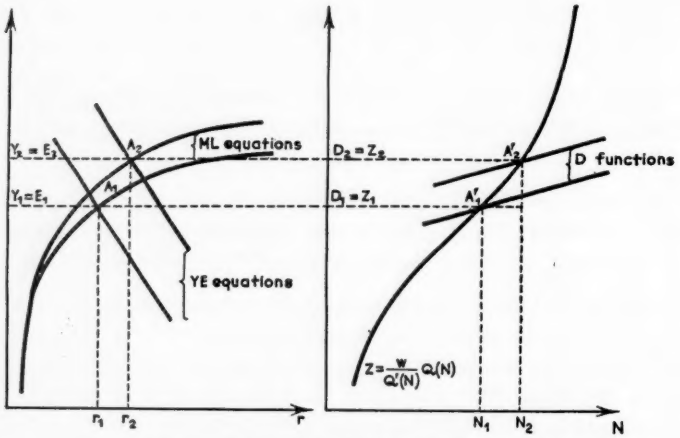


FIG. 1. The Equilibrium of supplied Employment, the rate of interest and Money Inputs and Outputs (18).

and $Y = E = D = Z$ equations. The whole system is represented graphically by Fig. 1 for two different positions of equations $M = L$, $Y = E$, and $D = Z$.

The ML equation is a two-dimensional relationship in Y and r, which keeps money demand equal to the given supply of money. The YE equation also is a locus of Y and r values, which, however, keep money

income (Y) and macro-economic spending (E) equal to each other.† Both are shown in Fig. 1.

With the wage level w as given, Z is a stable function. Hence the DZ equation (effective demand) depends mainly on the position and the shifts of D. The equilibrium level of D, on its turn, is related to the ML and YE equations (see Fig. 1). Effective demand, in other words, is determined by the factors influencing the quantity of money, the liquidity preference, the propensity to consume, and the inducement to invest.

This way of putting together the elements of the economic system, in our view, is in conformity with the headlines of the *General Theory*.

Fig. 1 does not only present an outline of the Keynesian theory, it also shows its policy implications.

In order to stabilize the aggregate supply function Z, the government will have to keep the level of money wages as stable as possible, at least in the short period. Since the equilibrium position of D then merely depends on the ML and YE equations, it will be necessary to keep these two curves, by monetary and fiscal policies and—in the event of a serious depression—by deficit spending, at a level which secures optimal employment.

Our diagram also demonstrates that the often emphasized achievements of the Keynesian system largely depend on the assumption of wage rigidity. Indeed, from the acceptance of w as a datum it follows that the aggregate supply curve Z is stable, that so-called equilibrium positions of less or more than full employment are possible, that a shift in the ML or (and) YE equations causes the equilibrium to shift along the aggregate supply function which, on its turn, involves a multiplier process, &c.‡

† For further comments, see: J. R. Hicks, 'Keynes and the Classics', *Readings in the Theory of Income Distribution*, pp. 461–76.

By totally differentiating the ML equation $M = L(Y, r)$ it follows:

$$0 = L'_Y\,dY + L'_r\,dr, \qquad \frac{dY}{dr} = -\frac{L'_r}{L'_Y}.$$

Since $L'_r < 0$ and may vary from $-\infty$ up to 0, and since $L'_Y > 0$, the slope of the ML equation, i.e. $-L'_r/L'_Y$ varies from $+\infty$ down to 0.

The slope of the YE equation can be computed by differentiating totally $Y = E(Y, r)$:

$$dY = E'_Y\,dY + E'_r\,dr, \qquad \frac{dY}{dr} = \frac{E'_r}{1 - E'_Y}.$$

In diagram 1 it has been assumed that $E'_r < 0$ and $0 < E'_Y < 1$. Hence the YE equation has been given a negative slope.

A dynamic version of the above model has been worked out in our book *De Geldkringloop in de Keynesiaanse Theorie*. The analysis has further been extended to the case of the propensity to spend E'_Y being equal to, or larger than 1. We also developed a multiplier theory in which the rate of interest and the price level, as well as employment and income, are allowed to change.

‡ As a consequence of the multiplier process, shown in our diagram, income will tend to raise from Y_1 up to Y_2, employment from N_1 up to N_2, the rate of interest from r_1 up to r_2, and the price level, according to the positions of the DZ equation, from P_1 to P_2. A 'true' inflation in the Keynesian sense will be attained when $\frac{\partial Z}{\partial N} = \infty$. It would of course be easy

As soon as flexible wages are assumed all these properties disappear. The aggregate supply function Z and the other curves start shifting, and it could easily be shown that, by introducing the traditional supply curve of labour and taking into account the action of monetary factors on the propensity to spend, the long period equilibrium will be one of full employment.† But, except for the case of $\partial L/\partial r$ becoming infinite—an assumption which Keynes himself did not consider as actually realistic—the author of the *General Theory* openly agrees with the above conclusion.‡ This means that the wage level is to be interpreted in the Keynesian system as a normative datum, and that the main difference between Keynes and the classics is to be traced back to a matter of policy. In our view, comparisons between the normative Keynesian system and the classical theory are not very meaningful. Keynes is to be compared to the classics on the basis of chapter 19, where the effects of changes in money wages are thoroughly analysed.§

IV. A Brief Comment on Simplified Models

(a) *The Keynesian summary on p. 29 of the General Theory*

It will perhaps be interesting to show how the preceding analysis is related to the summary of the Keynesian system on p. 29 of the *General Theory*.

Let us assume that investment is an autonomous variable, that consumption depends on employment and wages, and that the marginal propensity to consume is less than unity.

Under these conditions model 1 reduces to:

Model 2 (see Fig. 2)

$$E = C(N,w)+I, \qquad D = P.Q(N),$$

$$Z = \frac{w}{Q'(N)}Q(N), \qquad E = D = Z.$$

Although the context on p. 29 of the *General Theory* is far from being clear, it nevertheless appears that Keynes, on this place, introduces three different behaviour functions: the aggregate supply curve (Z), expected entrepreneurial proceeds (D), and planned macro-economic spending

to account for the inflationary pressure on wages by introducing a wage function such as $w = f(N)$, with $\frac{\partial w}{\partial N} > 0$.

† See, for example, Don Patinkin, 'Price Flexibility and Full Employment', *Readings in Monetary Theory*, pp. 260–70.

‡ *The General Theory*, p. 191: '. . . though in the extreme case where money-wages are assumed to fall without limit in face of involuntary employment, . . . there will, it is true, be only two possible long-period positions—full employment and the level of employment corresponding to the rate of interest at which liquidity-preference becomes absolute (in the event of this being less than full employment).'

§ See H. Vandenborre, *De Geldkringloop in de Keynesiaanse Theorie*, chap. viii.

(D_1+D_2). Hence it is easy to see that the equations $D_1+D_2 = D = \phi(N)$, on p. 29 of the *General Theory*, amount exactly to what is meant by the equilibrium conditions $E = D = Z$ shown in Fig. 2.

From dividing the equations of model 2 by macro-economic output $Q(N)$ it follows:

Model 3

$$e = \frac{C(N,w)+I}{Q(N)}, \qquad d = P,$$

$$z = \frac{w}{Q'(N)}, \qquad e = d = z.$$

This is something like a Marshallian version of the Keynesian principle of effective demand. In this model e and z may be viewed as traditional

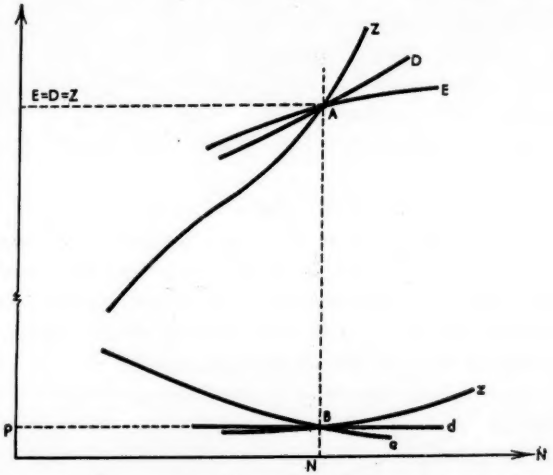


FIG. 2. Keynesian and Marshallian Diagrams showing the Principle of Effective Demand.

demand and supply functions, the intersection of which determines the equilibrium of the price level, employment, and output (see Fig. 2).

It would be easy to apply to this system the familiar cobweb analysis, and to develop, in this way, a kind of oscillatory price and employment (or production) multiplier.†

From model 3 and its graphic representation it appears that Keynes, by assuming a given wage rate, does not at all assume fixed prices, as some authors however have stated.‡ If both w and P were fixed, the above model could only be consistent with the marginal product $Q'(N)$

† See H. Vandenborre, *De Geldkringloop in de Keynesiaanse Theorie*, pp. 68–71.

‡ See, for example: D. Dillard, *The Economics of J. M. Keynes*, p. 206; A. Barrère, *Théorie économique et impulsion keynésienne*, p. 642.

being a constant and D and Z coinciding straight lines. This of course does not conform with the Keynesian way of thinking.†

(*b*) *The Hicksian Outline of the Keynesian Theory*

The behaviour functions D and Z having been dropped, model 1 reduces to:

$$Y = E(Y,r), \qquad M = L(Y,r).$$

These are the YE and ML equations, used by J. R. Hicks for a comparative study of the Keynesian and classical viewpoints,‡ and shown in Fig. 1.

From this system, the equilibrium values of the interest rate, income, and macro-economic spendings can be computed. The model, however, in no way explains how the transformation process of macro-economic consumption and investment (E) into factor income (Y) will be operated. This results from the fact that the functions D and Z, showing the role of producers in transforming E into Y, have been left out of the picture. Thus the supply side is systematically neglected in the above model. The same criticism of course applies to the nowadays widely used analysis by means of the 45° line, which represents the geometrical solution of equation $Y = E(Y)$.

V. Concluding Remarks

It could be shown that almost the whole confusion in and around the *General Theory* has arisen from the neglect to distinguish clearly between the four concepts which are at the basis of the present analysis, viz. monetary demand proper (E), demand as seen by the sellers (D), output valued at marginal cost (Z), and factor income (Y).

The equivoque already begins on p. 25 of the *General Theory* where D, though defined in terms of entrepreneurial proceeds, nevertheless is called aggregate *demand* function. This denomination suits better to monetary demand proper (E) and has induced many writers to comment the analysis on p. 25 of the *General Theory*, not as a DZ, but as a YE equation. On pp. 29 and 89 Keynes again creates confusion between expected entrepreneurial proceeds (D) and planned consumption and investment (E).

On p. 44 the aggregate supply function, i.e. macro-economic output valued at marginal cost, is called a function of expected proceeds. This confusion between Z and D reappears on p. 55, n. 2 and again on p. 280.

Evidently E, D, Z, and Y differ in the schedule sense§ but what is the relationship between E_0, D_0, Z_0, and Y_0 as observables?

† See, for example, *The General Theory*, pp. 17, 25, 55. ‡ J. R. Hicks, op. cit.

§ Confusions between the concepts represented by E, D, Z, and Y are frequent in descriptive post-Keynesian economics. See, for example, A. H. Hansen, *A Guide to Keynes*, pp. 29–35; D. Dillard, *The Economics of J. M. Keynes*, pp. 28–37; J. C. Antoine, *Introduction à l'analyse macro-économique*, pp. 255–62; A. Barrère, *Théorie économique et impulsion keynésienne*, pp. 282–7.

E_0 and D_0 relate respectively to spendings and entrepreneurial proceeds on the markets of consumption and investment. What on the side of the buyers has been considered as observable (E_0) is also to be considered as observable on the side of the sellers (D_0). Thus between E_0 and D_0 there necessarily exists a factual identity, whether or not equilibrium conditions are assumed.

Z_0 and Y_0 relate to the markets of intermediate services and denote the sum total of wages, rent, interest, and profits paid to (Z_0) and respectively earned by (Y_0) the factors of production. In a closed economy without government intervention, these aggregates also are necessarily and identically equal.

But what about the relationship between D_0 and Z_0?

There is of course no reason to believe that the proceeds of the employers from their output (D_0) will, at every moment, exactly be equal to the money they hand to the factors of production for their services (Z_0). Of course D_0 and Z_0 may coincide merely by chance or as a consequence of equilibrium conditions, but never as the result of identical relationships such as $E_0 \equiv D_0$ and $Z_0 \equiv Y_0$.

This follows from the very fact that two different markets, viz. the markets of aggregate output and intermediate services, are involved in the DZ-equation.

Hence according as to whether static or dynamic phenomena are studied:

$$\begin{array}{ccc} Y_0 = E_0 & & Y_0 \neq E_0 \\ \| \quad\quad \| & (6b) \text{ or } & \| \quad\quad \| \\ Z_0 = D_0 & & Z_0 \neq D_0 \end{array} \qquad (7b)$$

Since consumers and savers have been operating between Y_0 and E_0, and since E_0 consists of consumption C_0 and investment I_0, we shall have identically:

$$Y_0 \equiv C_0+S_0 \quad \text{and} \quad E_0 \equiv C_0+I_0.$$

From introducing these identities in (6b) and (7b) it follows:

Under equilibrium conditions

$$\begin{array}{ccc} \underbrace{C_0+S_0} & = & \underbrace{C_0+I_0} \\ \| & & \| \\ Z_0 & = & D_0 \end{array}$$

or

$$\begin{array}{ccc} S_0 & = & I_0 \\ \| & & \| \\ \overbrace{Z_0-C_0} & = & \overbrace{D_0-C_0} \end{array}$$

The equilibrium being disturbed

$$\begin{array}{ccc} \underbrace{C_0+S_0} & \neq & \underbrace{C_0+I_0} \\ \| & & \| \\ Z_0 & \neq & D_0 \end{array}$$

or

$$\begin{array}{ccc} S_0 & \neq & I_0 \\ \| & & \| \\ \overbrace{Z_0-C_0} & \neq & \overbrace{D_0-C_0} \end{array}$$

These brief considerations on E_0, D_0, Z_0, and Y_0, as observables, lead us to close this study by a series of important corollaria:

1° $I_0 \equiv D_0 - C_0$ is an investment and $S_0 \equiv Z_0 - C_0$ a savings definition.

2° What has been said about the relationship between D_0 and Z_0 applies, for exactly the same reasons, to S_0 and I_0. More specifically should be noted that the SI equation cannot be traced back to any identical relationship such as $E_0 \equiv D_0$ or $Y_0 \equiv Z_0$. It is merely the result of equilibrium assumptions.

3° The Keynesian definitions, according to which observable savings necessarily equal investment, involve a confusion between D_0 and Z_0, i.e. a confusion between the markets of final output and those of intermediate services. Keynes indeed defines savings by formula $D_0 - C_0$† whereas, in the interpretative part of the *General Theory*, he uses the savings concept $S_0 \equiv Z_0 - C_0$.‡

In other words, the author of the *General Theory* himself, in his causal analysis, did not follow the savings definition which has been the very object of the famous savings-investment debate.

4° As to the savings concepts really used in their theories, there is no essential difference between Keynes and Robertson. By savings and investment both economists mean respectively $S_0 \equiv Z_0 - C_0$ and $I_0 \equiv D_0 - C_0$. But whereas the former assumes equilibrium, so as to have $Z_0 = D_0$ and $S_0 = I_0$, the latter studies transition phenomena and thus assumes $Z_0 \neq D_0$ and $S_0 \neq I_0$.

5° Whereas consumption, in the interpretative part of the *General Theory*, means a disposal of factor income, a number of post-Keynesian writers have developed models in which consumption, like in a Robinson economy, seems to be interpreted as a disposal of real output. Savings then, defined as output not consumed, of course necessarily equal investment.

Considered from this point of view, an act of saving, however, either means a disposal of real output, just like consumption, or involve no economic decision distinct from it. The first interpretation does not fit the facts: in the real world, the object of saving decisions is not real output but real or monetary factor income.

† *The General Theory*, p. 63.

‡ Ibid., pp. 90, 166. According to p. 90 of the *General Theory*, consumption and thus also savings are a function of the income determined by employment. This income of course is $Z_0 \equiv Y_0$ and not $E_0 \equiv D_0$ which, under the Keynesian assumptions, depends on the propensity to spend, the inducement to invest, and the liquidity preference. On p. 166 saving is described as a disposal of income. The savers and consumers do not dispose of the entrepreneurial proceeds but of their wages, rents, interests, and profits. The only savings concept which corresponds to the behaviour thus described is $S_0 \equiv Z_0 - C_0$.

If saving, on the contrary, does not involve any economic decision distinct from consumption—an assumption which is also unrealistic—the savers are virtually eliminated from the system, and the whole economic activity will be a matter of producing, consuming, and investing.

This way, in one blow, some authors have succeeded:

in eliminating the saving decisions from their 'real' models;
in keeping therein nevertheless a savings function;
in getting an identical relationship *ex post* between savings and investment.

These assumptions, in our view, are not very well suited to the analysis of short-run phenomena. In the long-run analysis, however, they may perhaps be more realistic.

PRODUCTIVITY AND INFLATION[1]

By T. BALOGH

I. Introductory

1. The relationship of prices, wages production, and productivity in the U.K., the U.S., and Germany, is set out in Table I. The most striking feature of post-war development is the steady increase in real product and productivity. (Only in the U.S. were there two very slight temporary setbacks in both.)

2. In the U.K. national income expanded by some 18 per cent. since 1950, having risen over 10 per cent. in the previous three years, and output per head of the employed by 12·3 per cent. In most years the rise was above 2, often approaching 3 per cent. per annum. For sustained growth at a high level the period until 1955 (apart from 1951/2) has hardly a parallel in Britain in this century. Since 1955 growth has slowed down and with it productivity. It was indeed a remarkable performance.

3. Nevertheless, the period is also characterized by severe monetary disturbance. There were not less than five severe foreign exchange crises, one of them in 1949 leading to a devaluation of the pound by some 30 per cent. The cost of living increased by all but 50 per cent. since 1950. Money wages rose 61 per cent. in the same period leading to only a 12 per cent. rise in real wages. Real wages between 1948 and 1952 were practically unchanged, despite an almost 10 per cent. increase in productivity in that period. They only caught up with productivity in 1956, as the result of the slowing down of the rise in the latter.

4. In the U.S. and Germany a similar, if more rapid, development can be observed. American output per head increased some 16 per cent. between 1950 and 1956, German by 35 per cent. between 1950 and 1955. The expansion of real output was in these cases much faster: employment increased in Germany by 16 per cent.,[2] in the U.S. by 7 per cent. respectively against only 5 per cent. in this country. While in the U.S. and Germany the period is characterized by constantly favourable balances of payment and, in Germany especially, of vast accumulation of foreign exchange and gold reserves—yet the domestic monetary picture is not dissimilar. The cost of living between 1950 and 1956 increased in Germany and in the U.S. by 14 per cent. and money wages 58·6 and 41·5 per cent. respectively.

[1] This paper was written in Oct. and Nov. 1957 at the request of the Cohen Council which did not see fit to deal with any of the arguments put forward.

[2] The expansion of employment since has decelerated. But the increase in productivity has not shown any slowing down. Indeed, together with the virtual disappearance of unemployment, it has increased between 7 to 8 per cent. this year as against earlier rates of between 4 to 6 per cent.

4520.2

TABLE I

Year	*Money wages* (1950 = 100)				*Earnings* (1950 = 100)			*Cost of living* (1953 = 100)				*Real wages* (1950 = 100)				*Real earnings* (1950 = 100)		
	Germany	*France*	*U.S.A.*	*U.K.*	*Germany*	*U.S.A.*	*U.K.*	*Germany*	*France*	*U.S.A.*	*U.K.*	*Germany*	*France*	*U.S.A.*	*U.K.*	*U.S.A.*	*Germany*	*U.K.*
1947	73·4	53·1	84·4	86·9	..	..	..	81	..	83	73	84·1	..	91·4	96·4	..	..	..
1948	82·0	81·2	91·8	93·1	73·2	91·3	91·7	93	60	90	77	81·9	104·3	92·0	97·8	91·3	73·2	96·5
1949	93·8	90·8	95·2	96·1	91·8	92·6	95·1	99	70	89	79	87·7	99·9	96·3	98·6	93·5	86·6	97·0
1950	100·0	100·0	100·0	100·0	100·0	100·0	100·0	93	77	90	81	100·0	100·0	100·0	100·0	100·0	100·0	100·0
1951	113·3	128·1	108·2	109·9	113·2	109·1	110·2	100	91	97	89	105·1	108·4	100·6	99·8	101·0	104·8	100·2
1952	121·9	148·3	113·6	118·2	122·2	114·6	118·7	102	101	99	97	110·9	113·1	103·7	98·6	104·2	111·1	98·9
1953	127·3	152·6	120·4	124·5	128·6	120·8	125·1	100	100	100	100	118·1	117·5	108·6	100·7	108·9	119·1	101·7
1954	130·5	161·5	123·1	132·2	133·8	121·1	134·2	100	100	100	102	121·0	124·4	111·0	104·8	109·0	123·9	106·5
1955	139·1	174·0	127·9	143·3	143·5	129·0	146·2	102	101	100	106	126·8	132·6	115·3	109·4	116·2	130·5	111·6
1956	151·6	187·2	134·7	154·6	153·6	134·8	158·1	105	103	102	112	134·1	140·0	119·0	111·8	119·3	135·9	114·6
1957	158·6	196·1	141·5	160·9	156·4	138·7	161·1	106	104	103	116	139·1	145·2	123·9	112·3	121·7	137·2	..

5. The fact of solid growth was in the U.K., and, despite the freedom from international monetary complications, also in the U.S. and even in Germany plainly overshadowed by the problems created by the rise in money prices. This largely determined the fate of governments in the U.K. and U.S., none of which could deal with the rising trend. Until recently price levels have gone on rising. The recent slowing down of the process is (as it also was in the U.S. between 1952 and 1954) due to the fall in the prices of primary products, especially food and industrial raw materials. The consequent impoverishment and discomfiture of their producers, mainly the underdeveloped countries, which are often situated in strategic geographic positions, is nothing to rejoice about even if it was not bound to react on our own economies.[1] The problem of domestic money cost stabilization in the highly developed areas has obviously not been solved to date.

In the following pages we shall first review the various explanations put forward to explain these developments, because the precise nature of their causality is decisive in determining the policy which must be adopted to avoid a continuation of the monetary disturbance. In particular, we shall inquire whether the view which attributes the continuous upward pressure of prices to a simple excess of money-demand, to 'too much money chasing too few goods' is tenable. This would imply that the cause of wage increases was not the strong bargaining position of the trade unions under full employment, but the employers' overblown demand for labour derived from the inflationary increase in money demand for their products. Once this excess is eliminated through a (slight) cut in demand brought about by the subtle and elastic working of the price mechanism through tightening money and raising interest rates, and the consequent shift in the pattern of investment, stability could be achieved without much or, indeed, any sacrifice of growth. On the other hand, if this explanation is untenable, if the strength of the unions is responsible for the increase in money costs and that in turn for the rise in prices, completely different means have to be adopted to achieve stability without destroying growth and perpetuating stagnation. It is this question which is at the base of the most fundamental disagreement among economists in the free world and on the right answer to which its fate will depend in the face of the Communist economic and political challenge.

II. Theories of Excess Demand

(i) *The quantity theory of money*

6. There has been, in recent times, a strange recrudescence of the quantity theory of money in its crudest form, to explain the rise in prices,

[1] I have treated this problem elsewhere (*Financial Times*, 14 Nov. 1957).

i.e. making the volume of money in a direct manner (proportionately) responsible for changes in the price level ($p = XM.$) completely disregarding complications, even on the monetary side—complications which are responsible for changes in the so-called[1] velocity of circulation. The startling failures of monetary policy in the period 1927–35 seem to have been forgotten,[2] failures in checking either booms or slumps through an elastic and subtle influence on the price mechanism.[3] These failures found expression in a startling increase and fall of the velocity of money, offsetting, or more than offsetting, changes in the volume of money.

(ii) *Overloading the economy*

7. Parallel to this surprising rehabilitation of the quantity theory another, somewhat less implausible view was propounded, which would have identical operational implications. According to this view the cause of the upward pressure on prices and wages was an excess of demand, an overloading of the economy, a desire 'to do too much at the same time'.[4] Wages rose because of the 'insistent demand of employers for labour'. This created conditions—through lifting actual wages and earnings far beyond the basic contractual rates agreed with the trade unions—in which the latter were irresistibly tempted to demand ever higher wages. For a long time no statistical evidence was offered in support of this view. But lately the growing discrepancy between the rate of growth of earnings and of wage rates was pointed to as its conclusive proof.[5]

(iii) *Hidden demand*

8. On a slightly more sophisticated plane a negative demonstration of the same conclusion was attempted, by ridiculing the idea that trade

[1] The fact was completely disregarded that the velocity of circulation is a derived concept, a relationship between national income or money turnover to the volume of money, and as such unstable and unfit for prediction or operational purposes. The extinction of money hoards (i.e. the diminution of idle money balances due, for example, to an increase in the rate of interest) would *ipso facto* increase the velocity of circulation.

[2] For a discussion of recent literature cf. *Review of the Banco di Napoli*, 'The Ineffectiveness of Monetary Policy' (June 1957).

[3] The Chancellor of the Exchequer and the Governor of the Bank of England lent their authority to the support of this view (Mansion House Dinner, Oct. 1956). This disregard of the complexity of the problem was, surprisingly enough, also supported by *The Economist*. When statistical evidence was finally produced by the Midland Bank (*Bank Deposits and Currency*; *Review*, Nov. 1947) which could not be dismissed, a new version of the theory was produced, 'the price level is determined by the interplay of the supply of money, the stock of old money and "confidence" in the widest sense'. 'Confidence' in the 'widest sense', of course, makes no analytical sense: it can affect anything so strongly as to offset or more than offset the primary factors without having any systematic relationship with them.

[4] Cf., for example, President Eisenhower's address to the Autumn 1957 meeting of the International Monetary Fund and International Bank, *International Financial News Survey IMF*, 27 Sept. 1957.

[5] [The relationship between vacancies and employment used by the Cohen Council is an equally imperfect indicator.]

union demands for wage increases could be the cause of a sustained rise in prices. How would it be possible, it was argued, for prices to rise if demand were not excessive? But if prices did not rise entrepreneurs could not, of course, meet the demands of trade unions.

Finally Professor Galbraith[1] gave one of his brilliantly ingenious explanations why prices did not rise before the wage demands had been made and accepted: in a large section of a modern economy prices are administered ones. Thus in these sectors excess of demand will manifest itself in shortages rather than in a rise of prices, as the over-riding goal of maximizing profits over time (and the fear of price wars) will keep oligopolist competitors from meeting excess demand by raising prices to the short-run maximum.[2] Thus there always are 'unliquidated monopoly gains' which permit wage increases (and which will be taken once a general rise of costs eliminates the inhibition against raising prices).

9. This preoccupation with the existence of excess demand is, of course, quite comprehensible. If it is really the monetary excess demand for labour which is—at least mainly—responsible for the continuous rise in prices a solution could be found and the inflationary process ended by a relatively painless, and possibly slight cut in demand through monetary policy. Excessive investment would be curtailed (possibly consumption would also fall[3]) and the condition which gave rise to the inflation would disappear, without much unemployment or loss of production. Indeed—as an O.E.E.C. expert group argued in 1952[4]—technical progress might even be speeded up by dear money. Investment would be concentrated on the most productive schemes and expansion would continue. In any case doubts were cast on whether a higher rate of investment was in fact needed: 'Are these hardships necessary?' asked Mr. Harrod and his questionings were echoed by a majority of economists until very recently. The restoration of the bank rate, that subtle yet certain weapon of indirect control, to its traditional central (indeed unique) role would be finally vindicated.

III. The Fallacies Exposed

10. Such statistical evidence as is available is in stark contradiction to these explanations and invalidates the policy recommendations based on them. Now statistical evidence about any economic relationship must

[1] 'Market Structure and Stabilisation Policy', *The Review of Economics and Statistics*, May 1957, p. 124.

[2] High marginal taxation also reduces the impulse to reap short-run profits at the cost of impaired goodwill. Mr. P. Streeten and myself dealt with this problem in a somewhat different context. Cf. 'A Reconsideration of Monetary Policy', Institute of Statistics *Bulletin*, Nov. 1957, p. 331.

[3] Both because of the restriction of consumers' credit and because of the fall in the value of assets due to stiffer money conditions.

[4] Mainly on the basis of interesting metaphors drawn from motoring experience. *O.E.E.C. Report of Special Expert Group*, 18 June 1952.

necessarily be regarded as somewhat inconclusive: much of the relevant statistics are far from perfect and causal relations are often so complicated as to be unverifiable quantitatively. If theories which are flatly contradicted by such statistical evidence as is available must be suspect, statistical evidence in its turn will have to be regarded with some scepticism, unless it is obtained from a number of different fields all corroborating each other.

11. As we shall presently see, such cumulative and overwhelming evidence does in fact emerge from a study of the situation both here and in the U.S. This indicates beyond doubt that the inflationary process was in fact only to a minor extent due to demand inflation, and that 'dear money' and credit restriction are unlikely to deal with it, unless severe setback is inflicted on economic expansion in the industrial countries and even more dangerous risks are taken with the stability of the primary producing areas. In view of the startling challenge of the Soviet technical and economic progress neither of these risks can safely be taken.

12. In what follows we shall, first, deal one by one with the simple monetary explanations of the inflationary process and try, secondly, to arrive at a diagnosis of the situation more in conformity to known facts. We shall, finally, turn to formulate policy supporters which may in the light of these considerations offer some hope of a satisfactory outcome in terms of both stability and growth.

(i) *The volume of money and inflation*

13. The fact that the rise in the volume of money cannot account for the past, and a restraint of a further increase cannot vouchsafe the end of a future, upward movement of prices has now, somewhat reluctantly, been accepted by even the most vehement supporters of the so-called monetary school of thought.[1] It is perhaps surprising that it should have taken an article in a Bank review[2] to convince a majority of writers on these topics of the palpable fact that monetary circulation did not increase as fast in this country as, say, in Germany or the U.S., which underwent a much less violent inflation of prices, and that the velocity of circulation—itself a mirror image only of the relation of actual money turnover to currency and bank deposits—has rapidly increased under the stimulus of dear money and credit restriction.[3]

[1] Cf., for example, *The Economist*, 16 and 23 Nov. 1957, 'Money Matters'.

[2] Loc. cit. *Midland Bank Review*, Nov. 1957. [Since the writing of this paper further interesting material was published in the Annual Report of the Chairman.]

[3] The extent of the loss of memory in this respect is as amazing as it is disconcerting. Contrast, for instance, in this respect, Kalecki's writings on the relationship between velocity and interest rates and recent wishful writing concerning the effectiveness of restricting the 'fiduciary issue' (*Theory of Economic Dynamics*, London, p. 76).

(ii) *The effectiveness of monetary policy*

14. Equally conclusive is the evidence that monetary policy neither here nor in the U.S. had any of the desired and anticipated effects. For, as I have argued elsewhere,[1] monetary policy in order to live up to the claims of its advocates must work through its *effect* on production costs. Only if that impact alone were responsible for cuts in investment plans (i.e. the fact that capital intensive or time-consuming production processes become relatively more expensive as a result of the increase in interest rates), or if an increase in the rate of interest stimulated saving, would 'dear money' systematically discriminate in favour of capital-saving techniques and/or increase the amount of investment compatible with stability. Otherwise the impact of monetary policy will not be systematic: its effects will be haphazard, depending on the psychological make-up of entrepreneurs. It cannot, then, be claimed that progress is 'maximized' by dear money in any sense of that word.

15. Table II sets out the increase of gross domestic real product of gross

TABLE II

(In £million at 1948 prices)

Year	*Gross domestic product*	*Increase of gross domestic product above 1946*	*Gross fixed capital investment*	*Cumulative total to start of year*	*Value of physical increase of stocks and work in progress*	*Cumulative total start of year*
1946	10,434	0	1,058	..	−58	..
1947	10,501	67	1,304	1,058	356	−58
1948	10,830	396	1,430	2,362	173	298
1949	11,216	783	1,563	3,792	63	473
1950	11,523	1,089	1,641	5,355	−188	536
1951	11,966	1,532	1,647	6,996	400	348
1952	12,002	1,568	1,671	8,643	5	748
1953	12,471	2,037	1,849	10,314	95	753
1954	12,973	2,539	1,995	12,163	35	848
1955	13,431	2,997	2,124	14,158	230	883
1956	13,617	3,183	2,234	16,282	165	1,113
1957	..	..	..	18,516	..	1,278

fixed real capital investment and real investment in stocks and work in progress. Monetary policy seems to have no systematic impact on either fixed or liquid capital investment. Direct controls (as in 1950/1) have been more effective. Relaxation of credit in 1953/4 did not result in accelerated increase in stocks: that followed rather than preceded the revival of business. And if the control measures of the Labour Government succeeded in raising fixed investment from just a shade over 10 per cent. of the national product in 1946 to 14·2 per cent. in 1950, or by 42 per cent. through devoting not less than £500 million (all in terms of 1948 prices)

[1] Loc. cit., *Banca di Napoli*.

out of a total increase of the gross product of £1,100 million, to investment, progress since was much more biased to consumption: while gross product increased by a further £1,600 million between 1952 and 1956, investment increased by only £560 million. Thus the share of investment only increased from 14·0 to 16·4 per cent. or by 17 per cent., or less than half the previous rate, though of course it is clear that a much larger part of an increasing product could, without hardship, have been assigned to investment once total income had risen. The increase in the burden of armaments by no means explains this worsening: consumption increased by £1,100 million (and much more if housing is regarded as durable consumption-investment).

16. This poor showing of what might be called the 'price/cost mechanism' effect of monetary-interest rates policy whose subtle efficiency played so large a part in post-war economic literature[1] had induced its staunchest advocates to beat a hasty retreat: 'Provided', says *The Economist*, 'that pressure on the money supply is firm enough, the authorities cannot fail to *affect confidence*. [My italics.] Indeed, the criterion by which the adequacy of monetary restriction is to be judged is itself the state of business confidence.' This is far indeed from the original claims put forward on the subtly and rightly discriminating effects of monetary policy. But *The Economist* seems completely innocent of the welfare implications of its new line of argument.[2] This analysis seems to have been accepted by the authorities. The increase of the bank rate to 7 per cent. in September 1957 and the severe new restrictions on credit introduced at the same time, as well as the decision to cut basic public investment plans, openly abandon all claims made in favour of the subtle working of monetary controls through varying the cost of investment. The Chancellor reverted to the pre-war policy of *striking at the confidence of entrepreneurs* in the maintenance of full employment, by changing their anticipations. This new tactic can work only by means of a psychological shock. It is indiscriminate in its effects and, if successful, difficult to reverse.

(iii) *Employment and wages*

17. The ineffectiveness of monetary restriction is further demonstrated by the fact that a slowing down, or a setback in economic progress, such as happened in the U.S. in 1949, and then again in 1953/4, and in Germany in 1950, did not effectively slow down the increase in money wages. As Tables I and III indicate, the rise in money wages in these periods tended to outrun the increase in price-levels more than in times of full 'inflationary

[1] Cf., for example, Prof. Lewis, 'The Principles of Economic Planning' and Prof. Meade, 'Planning and the Price Mechanism'.

[2] Cf. *Bulletin*, loc. cit., sections 1 and 2.

pressure'. The fact that the cost of living fell between 1948 and 1949, and remained unchanged in 1953/4, did not prevent a 3 to 4 per cent. increase in money wages in both of these periods: indeed the stability of the price level can be directly traced to a fall in primary (especially food) prices. The basic domestic inflationary pressure was not halted.

TABLE III

Real National Income and Productivity
1950 = 100

	U.S.			*U.K.*			*Germany*		
Year	*Real national income*	*Employment*	*Output per head*	*Real national income*	*Employment*	*Output per head*	*Real national income*	*Employment*	*Output per head*
1947	87·4	95·4	91·6	90·0	..	..	..	..	..
1948	92·2	97·4	94·7	93·1	98·1	94·9	..	..	..
1949	90·8	98·4	92·3	97·2	98·9	98·3	..	..	..
1950	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
1951	105·4	99·7	105·3	103·5	101·0	102·5	114·4	100·6	113·7
1952	109·0	99·8	109·2	104·4	100·6	103·8	121·5	103·0	118·0
1953	113·8	101·1	112·6	108·9	101·1	107·7	130·5	107·4	121·5
1954	112·2	102·2	109·8	113·1	102·8	110·0	141·3	111·3	127·0
1955	121·1	104·4	116·0	116·9	104·3	112·1	156·4	116·1	134·7
1956	124·2	107·0	116·1	118·3	105·3	112·3	..	..	..
1957	..	..	..	..	104·5	..	..	..	..

18. Now it would be foolish to pretend that restrictive monetary policy striking at general business expectations could not halt the rise in prices. It certainly could. The solution might even be secured without severe social unrest and wage struggle if the government were successful in creating an atmosphere of fear, of anticipation of considerable unemployment, without actually having to cause mass-unemployment. Wage stabilization can no doubt be enforced on the trade unions, in contrast to their voluntarily accepting a measure of restraint. But it can be so enforced only after a serious defeat, as in 1921 or 1926, or the fear of such a serious defeat. There can be no question that an atmosphere of such fear can be created. The only question is whether the cost of creating it is not too high for the community as a whole. An approximate indication of what might be involved can be gleaned by reflecting that the slowing down of the increase in the cost of living after the end of the Korean boom, and the sharp increase of unemployment in Britain from an average of 250,000 in 1951 to an average of 410,000 in 1952, did not in Britain prevent a remorseless increase in money wages. Unemployment in the U.S. more than doubled between 1948/9 (from 3·0 to 6·2 per cent.) and again between 1953 and the first half of 1954 (from 2·8 to 5·7 per cent.). As Table I demonstrated, there was no effect on the wage spiral. If a severe psychological shock is needed to cow the trade unions, much higher rates of unemployment might have to be contemplated to convince trade unions of the dangers of further resistance. Even if we disregard completely the

structural unemployment[1] in pre-war Britain connected with the decline of localized staple export industries (and such disregard is hardly legitimate as *any*, even localized, mass-unemployment no matter by what it was caused would have important and nation-wide psychological effects), stability of money wages seems to have been correlated with unemployment of between 4 to 6 per cent.[2] Since then trade union organization both here and in the U.S. has increased in power and coherence. Thus the level of unemployment required has presumably also risen further.

(iv) *Money earnings and money wages*

19. Only recently[3] have writers of the 'demand inflationary' school of thought (i.e. that which believes the problem is caused by demand inflation) put forward the argument that the increase in earnings relative to wage rates provides a conclusive proof of their theory since shows that entrepreneurs are willing, indeed eager, to pay overtime rates and rates above minimum trade union rates in order to secure manpower to satisfy the inflated demand for their products.

20. On this point statistical proof does not seem capable of being conclusive. A relative increase in earnings might well be brought about by demand inflation, by the restless search of employees for labour. It is at least equally possible and perhaps even more likely that it is brought about by the bargaining strength of the unions (due to full employment) being used to cut hours rather than force up wage rates, and thus to obtain increases in overtime earnings (and push up the latter relative to wage rates). In any case the argument is irrelevant to the present position. Such statistics as exist (Table IV) show that price rises continued when earnings relatively declined. In all three countries earnings in the last years fell relatively to wages: in U.S. and Germany since 1955 and in the U.K. since 1956. Nevertheless, the ratio of real earnings to output per head tended to increase; and so did money wages.[4] Here again all available

[1] Cf., for example, Prof. A. Robinson's review of Lord (then Sir William) Beveridge's *Full Employment in a Free Society* (*Economic Journal*, 1945, pp. 74–75).

[2] In the U.S. even this rate of unemployment does not seem to stem sharp wage demands.

[3] For example, Prof. Robbins in *The Listener* 1957 still did not adduce statistical evidence to buttress his belief in demand inflation.

[4] Prof. Allen, who does not seem to hesitate to impute bad faith to *The Times* ('On the Decline in the Value of Money', Stamp Memorial Lecture, p. 14), seems singularly reluctant (ibid., p. 26, especially the footnote) to bring out this point clearly. And he is also rather careless in his own presentation (nor is he even remotely justified in his disparagement) of Mr. Dow's extraordinarily effective testing of the nature of inflation. Such statistical material as he uses (his fig. 2 which contains the vital clue to the understanding of the problem of inflation since 1954, cf. ibid., p. 26) is drawn in such a way as to minimize the difference between the working class and the 'all consumers' index. Nor is there any indication that (as the working class is *included* in the 'all consumers' index) this method does not bring out the *growing* discrepancy between the working-class and non-working-class price levels. The 1938 basis, moreover, completely misrepresents the contemporary impact of price changes. Cf. below, paras. 38–41.

material massively points away from the explanation of the inflationary process as originating in 'too much money chasing too few goods'.

TABLE IV

Relation of Output, Earnings, and Wages

	U.S.			*U.K.*			*Germany*		
Year	*Output per head*	*Real earnings/output per head*	*Earnings/ Wages*	*Output per head*	*Real earnings/output per head*	*Earnings/ Wages*	*Output per head*	*Real earnings/output per head*	*Earnings/ Wages*
1947	91·6	..	..	..	..	..	..	..	..
1948	94·7	96·4	99·5	94·9	101·7	98·5	..	..	89·3
1949	92·3	101·3	97·3	98·3	98·7	99·0	..	..	97·9
1950	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
1951	105·3	95·9	100·8	102·5	97·8	100·3	113·7	92·2	99·9
1952	109·2	95·4	100·9	103·8	95·3	100·4	118·0	94·2	100·2
1953	112·6	96·7	100·3	107·7	94·4	100·5	121·5	98·0	101·0
1954	109·8	99·3	98·4	110·0	96·8	101·5	127·0	97·6	102·5
1955	116·0	100·2	100·9	112·1	99·6	102·0	134·7	96·9	103·2
1956	116·1	102·8	100·1	112·3	102·0	102·3	..	..	101·3
1957	..	..	98·0	..	..	98·5	..	..	98·6

(v) *Productivity and restrictions*

(*a*) *The short run*

21. If, then, on closer scrutiny the explanation of our difficulties based on excess demand seems to break down even on the 'monetary' side, post-war developments on the 'real' side cast further doubts on its validity. If monetary restriction, within the limits practicable, result not in a fall of prices but of output and of productivity, little will have been gained by deflating the economy even from the viewpoint of restoring its international competitive power.

22. This is, in fact, precisely what appears to have been the case in the post-war period. Table IV gives the rate of real efficiency earnings (the latter being defined as the ratio of real earnings to output per head). It is seen that whenever output fell (or did not increase as fast as before) real efficiency earnings *increased*. In the U.K. this is observable between 1948 and 1949 and again after 1953: in the U.S., much more strikingly in 1949, and, again, in 1954. *This movement is inverse to the movement of the ratio of earnings to wages.* The hypothesis of demand inflation being responsible for the monetary malaise is once again flatly contradicted by factual evidence.

23. Now it might be argued that the interruption of expansion would shock entrepreneurs out of the confident belief that prices will rise continuously. They would, the argument continues, then resist wage demands, and cease to hoard labour and press for increased efficiency. Prices would be stabilized, if they did not fall. Thus physical expansion could be resumed with less risk of price inflation. And, as the lesson is repeated whenever the wages price spiral threatens, this policy could eventually vouchsafe steady

growth *and* monetary stability. This vision of intermitten monetary restriction is not inconceivable. But it does not happen to have any relation to what has actually happened: *it was productivity that fell* with decreasing output, and money wages increased despite increasing unemployment. It was profits which came under severe pressure as efficiency earnings increased.

(*b*) *The long run*

24. Now all this does not *prove* that there is no level of unemployment at which wage claims will be moderated and prices will decline as a result of causes influencing the domestic cost level (in contrast to those due to the fall of import—or, as in the U.S. of non-industrial prices and incomes). There undoubtedly is. What is certain[1] is that that level has not been reached either in the U.K. or even in the U.S.

25. If, however, even higher rates of unemployment must be contemplated in order to guarantee wage stability, two long-term factors adverse to increase in productivity must not be left out of account. The first is the decline in investment. The second is the increase in the trade union resistance to improved techniques.

26. There has been a tendency to regard the problem of inflation entirely in the light of comparing the overall relation of supply and demand (much in keeping with the revival of the quantity theory of money), disregarding changes in the composition of output. This tendency is plainly the outcome of the general upward pressure on prices due to the uninterrupted maintenance of demand and employment at high levels. Even when there was a slowing down of the increase (and, in the U.S., a reduction) of demand, investment continued to expand. The psychological shock-treatment now advocated to cure inflation might well produce a substantial downward revision in investment decisions which, in turn, would reduce income and consumption. Quite apart from the (temporary) loss of output, the impairment of confidence might reduce the eagerness of entrepreneurs to push on with the rationalization of production which was due to the difficulty of securing manpower and the desire to be—relatively—independent from trade union pressure. Thus the drive to innovation which showed a marked increase in the post-war as compared with the pre-war period might once more flag.

(*c*) *Present position*

27. From this point of view the present position could hardly be more unstable.[2] Far from being overloaded, productive capacity both here and in the U.S. is not being fully utilized. Net investment has increased U.S.

[1] Cf. above, para. 18.

[2] [This was written in the autumn of 1957.]

capacity by about 6 per cent. per annum in the past few years. Yet final output has not increased at all, and is now falling. In the U.S. automobiles and some heavy chemicals are now working at a level of output barely above half of capacity, oil refinery capacity is used below 80 per cent., steel is expected to be cut below 70 per cent. In this country the excess productive capacity is smaller, but appreciable and growing. This surely is not a situation in which money can be said to chase scarce goods. Commodity output could increase in the U.S. by some 15 per cent., food consumption by more, without reaching the limits of productive capacity. It is difficult to understand how this situation could be described as President Eisenhower did in his speech to the International Monetary Fund as 'wanting to do too much at the same time'. Now in the pre-war years such a concatenation of things would, in all probability, have led by itself to a downturn of investment. This in turn would have reduced income and consumption and thus paved the way for a cumulative shrinkage of investment, which in turn would have cut income and so on. In the post-war period this interaction did not happen. A decline in consumption in 1949 and 1953/4 did not evoke a cumulative fall in investment which could in its turn have reacted on consumption. It was *durable* consumption and stocks which proved to be the source of such instability as there was. Investments remained high, even in the *U.S.*, and responded instantly to stimulation via cheaper money, &c. In the *U.K.* investment plans had to be forcibly cut back, either through controls (as in 1947 and 1949) or through credit squeeze (as in 1952/3 and 1955/7), and in fact never declined. What happened was that scheduled increases were postponed or reduced. If *one* single reason would have to be given why the pattern of economic relations has changed, confidence in government policy of full employment is probably the most important. No doubt other factors such as the increase in the population in the U.S., the need for modernizing plant, rearmament, &c. &c., can be adduced to explain why investment has not been cut back even when appreciable falls in consumption took place. Entrepreneurs were convinced all would come right in the end, and that failure to invest would meet lost opportunities, and severe setbacks in relative competitive power. The penalty of *not* investing was severe. It should be said quite firmly, however, that any severe and sustained attack on this psychological framework would bring with it shocking consequences. The dangers of the situation are manifest: only foolish people will not let sleeping accelerators lie.

28. Nor can there be much doubt that willingness of British trade unions to tolerate technical innovations was very much impaired in the inter-war period of heavy unemployment. It was only with difficulty and diffidence that trade union leadership could bring the rank and file, even

after years of full employment, to accept new, especially labour-saving, techniques. A return to the pre-war sequence of booms and slumps, involving a relatively high average rate of unemployment over-time, would be disastrous from this point of view. It would certainly intensify wage pressure whenever expansion restarts, for the restraining effects of the increase in productivity would be very much impaired. In a period when both German and Russian productivity seem to be accelerating, it would condemn this country to a relative and subsequently—through a possible worsening of the terms of trade—even to an absolute decline in the standard of life. The social and political consequences of such a turn would be incalculably unfavourable.

(d) Germany and Britain

29. Nothing demonstrates the paramount importance of this consideration better than a comparison of British and German developments. Between 1950 and 1956 German fixed investments has increased from Dm. 17·3 billion to Dm. 35·3 billion in 1950 prices, i.e. by over 100 per cent. Investment in manufacturing increased even more steeply. In the same period British investment only increased from £1·6 billion to £2·2 billion at 1948 market prices, i.e. only by 25 per cent. and investment in manufacturing from £450 million to £623 million. German investment *per capita* in producers' durables has now well overtaken the British investment, and is still on the increase.[1] Yet British consumption is still some 25 per cent. above the German level. Moreover, in Germany the share of the metal and engineering industries in total manufacturing investment also increased from 32 per cent. to 56 per cent. between 1950 and 1954. In Britain the increase was only from 37 per cent. to 42 per cent. It is in these industries that demand for exports still remains buoyant.

It is not astonishing that the German real national product rose at an average rate of some 10 per cent. per annum and that this rate of increase only slackened by 2 or 3 per cent. this year, despite the attainment of practically full employment and the decline in immigration which severely reduced the increase in the number of employed. The corresponding figure for Britain, even up to 1955, was only some 3½ per cent. British production since 1956 has practically ceased to grow.

Nor was there a conflict in Germany between investment and exports. Germany was able to increase her exports from $2.0 billion in 1950 to $8·4 billion in the second quarter of 1957, as against a British increase from $6·3 billion to only $9·8 billion. German exports in durable consumer

[1] While in Britain industrial construction plans slumped in 1956 and were further cut in 1957, in Germany they increased considerably over the previous year and are still rising. Cf. *U.N. Economic Bulletin for Europe*, vol. viii (Aug. 1956), p. 12, table 1.

goods rose by more than 50 per cent. since 1954. Britain, however, suffered a slight setback in 1955/6 from which recovery was slow. The continued balance of payments surplus of Germany has lifted German gold reserves, at $5,780 million a multiple of the British level (some $1,200 million excluding foreign borrowing).[1]

This expansion of investment and productivity had a double impact. On the one hand the pressure for higher money wages slackened. The trade unions appear to have been satisfied by the progress achieved, and the high rate of technological advance weakened their bargaining power. Both factors combine to make a perverse relation—if any—between increases in wages and productivity highly likely. The increase in *money* wages in the United Kingdom and Germany since 1948 has practically been identical. No doubt wages in Germany were catastrophically low and even now remain so relatively to productivity: but *the rate of increase* in money wages has been *identical* in the two countries and real wages increased in Germany three times faster.

In the past year the expansion of German manpower slackened and unemployment was reduced to 1·9 per cent. (Sept. 1957). Yet production —and productivity—expanded by no less than 7 per cent.[2] The index of the cost of living only rose 2 per cent. in the first nine months of 1957, while wages increased some 7 per cent. Stability was within the grasp of the German economy despite the direct expansionary influence arising from the vast excess of exports. The lesson is clear.

(vi) *The balance of payments and the nature of inflation*

30. The first sign, almost, of a demand inflation, of an 'over-loading' of the economy, is a worsening of the balance of trade; internal demand increases above normal domestic supply and absorbs what would otherwise have been exported, as well as attracting more imports.

31. Now the picture of both the U.S. and the U.K. economy is in violent contrast with this state of things. American exports have vastly expanded in 1957. They rose in the first half of the year roughly $1 billion per quarter above 1956, while imports hardly budged. In the international economic relations of that country there is not even the slightest sign of an over-burdening of the economy: and this completely confirms the state of underemployment of productive capacity which emerges from the analysis of the relationship between productive capacity and output. Indeed the dollar shortage which has been buried with such solemn rites by a large majority of economists has not merely reappeared, but its

[1] To which other foreign assets of the Treasury of between $800–1,000 million should be added.

[2] Monthly report of the Deutsche Bundes Bank, Oct., 1957, p. 27. Earlier in the year the rise was at the rate of 8 per cent. per annum.

existence has been accepted by a number of writers who have hitherto been at pains to deny its very possibility. The world in the first half of 1957 has been losing gold to the U.S. at the alarming rate of $2 billion per annum despite a record export of capital by the U.S. amounting to over $3 billion—a rate which will hardly be maintained in a period of declining primary prices.

32. The picture in this country is only superficially different. Its gold reserves have no doubt diminished prodigiously. But the unfavourable overall balance of payments is by no means due to a worsening of the *current* balance which alone is related to the relation of domestic supply and demand. British exports have been steadily rising and are some 5 per cent. above last year's. Imports have no doubt also been rising in volume but by no more than exports. In value the relationship is even more favourable as the terms of trade have been steadily improving. Whatever is the portent of these developments—and it would be foolish to rejoice at them because they can bring at best only temporary relief[1]—they in no way support the view that the country is faced with demand inflation. The current balance of payments *has considerably improved* this year after the setback due to the Suez crisis, and despite the liberalization of trade and payments in the Sterling Area which progressively deprived Britain of a powerful preference. In the five years between 1952 and 1956 the official estimates of the current account showed a visible surplus of well over £900 million. The true surplus must have been considerably greater—there is in all probability a considerable flight of capital concealed in the published figures.

33. The cause of the depletion of the British reserves must be sought in in the export of capital. This has in the same period been officially put at just over £900 million. Now a part of the *current export surplus* is no doubt directly due to the *capital export* needed to maintain the position of Britain as the centre of the Sterling Area and secure its best markets. There were also unavoidable repayments of sterling obligations.[2] But with the gradual relaxation of foreign exchange control (e.g. the so-called Kuwait gap and the still wide 'soft dollar' purchases) an increasing portion of this export was a haphazard and speculative investment in the U.S. and Canada without any even indirect benefit to the economic strength of the country or the coherence of the Sterling Commonwealth.[3]

34. In particular, it was the export of capital by British subjects rather than withdrawals by foreigners which explains the last crisis of the late

[1] Cf. paras. 5 and 11 above.

[2] Though unfortunately far too small. The losses of the Sterling Area members on their sterling investments necessarily undermine confidence in London as a financial centre.

[3] A large part of these purchases resulted in dollar capital losses hardly compatible with the present position of Britain.

summer of 1957. It had nothing to do with 'too much money chasing too few goods'. Nor can our losses of dollars be blamed on the orderly export of capital to our Colonies and the Commonwealth for which we are responsible, or even the 'drain by India', drawing on her sterling balances. A tremendous surplus—£172 million—was earned in the first six months by the rest of the Sterling Area in the dollar area which helped us to finance our own—relatively small—deficit in that period. The fact is that Sterling Area reserves have increased substantially in London despite our considerable losses of gold. Even if we take into account the 'speculative swing', the acceleration of payments for imports and the postponement of the surrender of foreign exchange earned by exports, it was the export of capital which was decisive in the last exchange crisis. If it had not been for that factor the loss of gold would have been quite tolerable: neither can the 'swing' continue indefinitely nor can foreigners draw beyond a certain point on their London balances. But the export of domestic capital, unless controlled, is in principle limitless. Thus the advocacy of 'swingeing' increases in interest rates is patently beside the point even in the short, and (through its influence on investment and international competitive power) patently suicidal in the long run.

(vii) *Conclusions*

35. Thus a detailed analysis of production, productivity, wages and prices, both in domestic and in international relations, *irresistibly and cumulatively leads away from the explanation of the continuous increase in current prices here and elsewhere by the excess of money demand, and in particular by the increase in the volume of money.* As we have seen, the relationship between productivity, prices and wages, and monetary factors is not a simple one. There is no reason, therefore, to expect that monetary restriction should be successful in the sense of safeguarding *both* price-stability *and* steadiness of expansion.

36. I have tried to point to the reasons for the relative lack of success in monetary policy. But this does not mean that its energetic and ruthless rise could not halt the upward drift of prices. But its effectiveness as shock-treatment is not discriminatory or capable to bring about the economic combination of available resources. It is haphazard and likely to involve severe under-employment of resources. In particular there is no reason to expect that, *if* effective, it could bring about *an increase in investment* by encouraging saving, and thus increasing the volume of actual investment, even though leading to a cut in investment *plans*. Savings, as we have seen, are unresponsive to changes in interest rates, and once investment plans are being revised downwards there is no reason to expect a maintenance of investment. Indeed it is much to be feared that

the pre-war sequel, the cumulative shrinkage of investment and consumption might not be avoided, or, if avoided, that monetary policy could be successful in preventing a restart of the increase in wages and prices. A temporary check on wages imposed on expansion by making trade unions uncertain will accelerate the price drift through the unfavourable impact on the long-run increase in productivity of a revival among them of the restrictionist spirit.

37. A reconsideration of the explanation of the monetary instability on which recent British (and American) economic policy has been based is overdue, and, with it, a reconsideration of that policy.

IV. The True Explanation: Cost Inflation

38. Three distinct periods can be distinguished since the end of the war in which prices showed particular instability: the first between 1946 and mid-1948, the second from the middle of 1950 to early in 1953, and the last from the middle of 1954 onwards. An investigation of the nature of the process in these might give a clue to the real cause of the upward thrust.[1]

39. The first two contrast sharply with the last in that import prices in the first period rose by well over a third, in the second period by almost 50 per cent. In the third period to date there was all but complete stability in import prices (they rose from 100 to 103 (1954–100) at a level some 10 per cent. below 1952). We have seen that domestic prices and wages in the first period rose by 10 and 11 per cent. respectively, in the second period by just under 25 per cent. There can be little doubt that it was mainly the increase in import costs which exerted a destabilizing influence, though decontrol and the abandonment of subsidies as an instrument of stability had also some effect. The 'demand-pull' type inflation had very little to do with either, though decontrol might have created a temporary excess liquidity in 1946/7.

40. The situation since 1954 is very different. The relative stability in the previous year-and-a-half was obviously due to the fall in import prices coinciding with the slow 'working through' of the previous inflationary bout. This offset the effects of the acceleration of decontrol measures for a time. After 1954 there was no such countervailing force. Thus the wage-earners price level which was relatively stable between 1952 and 1954 began to rise sharply: Table V shows the relation between the level of prices paid by all consumers,[2] the cost of living index number, and an index of prices

[1] I should like to refer once again to Mr. C. Dow's brilliant 'Analysis of the Generation of Price Inflation', *Oxford Economic Papers*, vol. 8, pp. 252–301.

[2] *Central Statistical Office National Income and Expenditure 1957*, table 4.

TABLE V

Prices in the U.K.

	1948	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*
1. All consumers	100	102	106	115	121	124	126	130	136	..
2. Price-level cost of living	100	103	105	116	126	130	132	138	145	151
3. Non wage-earning consumers' price level	100	101	107	114	116	118	120	121	125	..
4. (2)/(3)	100	102	98	102	109	110	110	114	116	..
5. Total consumers' expenditure	8,471	8,831	9,348	10,065	10,584	11,256	11,978	12,763	13,409	..
6. Wage payments	4,180	4,425	4,610	5,105	5,455	5,770	6,165	6,760	7,375	..
7. Other consumers' expenditure, (4)/(3)	4,291	4,406	4,738	4,960	5,129	5,486	5,813	6,003	6,034	..
8. Real wage-earners' consuming power.	4,180	4,296	4,390	4,401	4,329	4,438	4,670	4,899	5,086	..
(4)/(2)	100	103	105	105	104	106	112	117	122	..
9. Other consumers' consuming power.	4,291	4,362	4,428	4,351	4,422	4,649	4,844	4,961	4,827	..
(5)/(3)	100	102	103	101	103	108	113	116	112	..

paid by non-wage-earners.[1] It is seen that the relationship moves against labour between 1951 and 1952 and then again between 1954 and 1956. It is this pressure on the relative real wages through a disproportionate (45 per cent. as against only 25 per cent. in the rest of the population) rise in the prices paid by wage-earners, which led to the recent disturbances in money wages and prices.

41. Now it is quite evident that the struggle of the trade unions was largely vitiated: as wages rose so did prices (though in the last few years, especially since 1955, there has been a slight gain in the consuming power of wage-payments relative to the consuming power of the other incomes). This is clearly shown by calculating the purchasing power of wage payments in terms of 1948 and deflating the difference between total consumption and wage-payments by the price index number of non-wage-earners' expenditure derives previously. It is seen that wage-earners' purchasing power rose considerably less than the real consumption of non-wage-earners: 7 per cent. as against 12 per cent. between 1951 and 1954. Since then the relationship was drastically reversed. But as domestic prices (as against those of imports) are still rising the workers would be premature in rejoicing in their capacity of increasing their real purchasing power and the share of wages in real income through wage claims.[2]

42. It should be noted that there is no need to assume the existence of excess demand in order to show that trade union claims led to the increase

[1] Calculated as a residue: $P = \text{all consumers} \times \text{total consumption} - \frac{\text{cost of living} \times \text{wage payments}}{\text{total consumption} - \text{wage payments}}$.

[2] Moreover, private savings increased precipitably and must be attributed mainly to non-wage incomes thus reducing their share in real consumption.

in prices.[1] It would suffice if entrepreneurs thought, as indeed they could not fail to do, that individual wage demands are part of a general wave, likely to be self-justifying. The point has received ample attention in connexion with the problem of starting development in a poor country, a problem which has been in the forefront of interest recently.[2]

43. No doubt *singly* no entrepreneur could grant wage increases for he could not be sure of being able to pass on the addition to his costs by raising prices. But if all (or most) entrepreneurs are faced with almost identical wage demands, and react to them in more or less identical manner, experience will teach them that it is safe to accede to these demands: it will be the increase in income due to the wage-bargain (including of course the increased profit) that will provide the additional demand required to sell output at the enhanced price. There is no need to postulate a hidden, 'unspent' or dormant, excess demand which becomes 'active'. The fallacy of those who are looking for the unseen and unseeable is that they apply the *ceteris paribus* method to a situation where the change by itself vitiates it because it is of a finite and not of an infinitesimal magnitude.[3] Provided that the process is general, as it is, and repetitive, as it is bound to be, if single wage bargains overshoot the average, as they are bound to do, there is nothing to stop it from accelerating its velocity as anticipations of further wage and prices increases swell speculation.

44. It is clear that in this country a solution cannot come from a unilateral pressure on trade unions as it has come in Germany in the years between 1950 and 1955. Mass-immigration and the financial weakness of the unions were the twin pillars on which the remarkable increase in investment rested which subsequently permitted an accelerated rise in real wages without encroaching on the basis of the expansion by raising the share of wages in the total national revenue here. Neither factor can be expected to help the achievement of stability without stagnation. The conclusion is inevitable that growth and stability are only compatible in a 'free' system if productivity rises sufficiently to meet trade union demands without the need for an increase in prices. At the same time an increase in productivity should mitigate the drive towards higher money-wages as the rise in real-wages accelerates and dissatisfaction of the wage-earners with their income-position is mitigated. Monetary policy cannot be expected to help in this respect: in the circumstances that prevail in Britain, and, pr ably, also in the U.S., it could only attain stability at the cost of ending gr wth.

[1] Cf. above, Section II, paras. 8 and 9.

[2] The so-called case for 'Balanced growth' rests on a similar argument. Cf., for example Prof. Nurkse's *Problems of Capital Formation in Under-developed Countries*, Oxford, 1953.

[3] This was demonstrated over 30 years ago by Professor Sraffa 'Laws of Returns under Competitive Conditions', *Economic Journal*, 1926.

V. The Outlines of Solution

45. It is clear that a double-pronged attack on the problem is the only one likely to succeed. Investment must be increased to accelerate the rise in productivity (and thus in the ability to satisfy wage demands) *and* wage-demands must be mitigated first to permit an increase in investment and subsequently (and to a much lesser degree) to keep them within the bounds of the increase in productivity achieved.

46. Neither can be achieved without the whole-hearted *co-operation of the trade unions*. But such co-operation can hardly be expected if restraint is not imposed upon profits. Nor would it be equitable if the restraint on profits took the form of a mere dividend-limitation, for the accumulated undistributed profits represent an enhanced claim on future earnings and, through their capitalization in the form of higher equity prices, also enable subsequent capital consumption without impairing wealth.

47. *Taxation and Budget Policy* would therefore have to be readjusted to secure both social justice *and* higher net savings. This could only be achieved in the initial period[1] if an overall budget surplus were created sufficiently large to secure a decrease in consumption despite a more equal distribution of personal incomes after taxes. Consequently taxes on wealth (including capital gains) and higher incomes would have to be contemplated sufficiently stiff to prevent their being paid entirely by a reduction of private personal savings. Such increase will also be needed because wage restraint will hardly be politically practicable without first plainly demonstrating that social justice will be safeguarded. This would represent a diametrical reversal of the policies pursued in recent years. But their consequences have, in my opinion, demonstrated that stability and growth cannot, in combination, be attained by those policies.

48. In British conditions an overall surplus of £300 million per annum would represent a starting minimum. The eventual target aimed at should be considerably higher or between £500 and £600 million. This would correspond to a conventional budget surplus of perhaps between £900 and £1,200 million. It should permit an increase in total resources available for investment initially of at least 1 per cent.; of the national output increasing, as time went on, to between 4 and 5 per cent. Such an increase, *if well utilized*, should permit a very substantial—perhaps as high as 50 per cent.—increase in *productive* investment, mainly in manufacturing and in public utilities supporting it.

49. Inevitably, therefore, a much closer direct *control over investment* (possibly through building licensing alone) will become essential as well as

[1] Subsequently as investment and output rose consumption would not have to be cut; only its increase limited for a time well below the increase in total output.

discriminating tax concessions and, possibly, guarantee of loans and provisions of buildings and equipment at favourable conditions to encourage desirable investment. Such *stimulus to investment* would be able to counteract the deterrent effect (if any) of increases in direct taxation. In my opinion capital export, and in that connexion foreign trade, would also have to be recontrolled in order to prevent the recurrence of the sort of discreditable foreign investment which caused the last foreign exchange crisis and bids fair to wreck the steady expansion which has characterized British economic history since the war.

50. A cursory analysis of the statistical material submitted in Tables I and III shows that, even if some pressure has been put on non-wage incomes lately, profits tended to increase, especially in the periods when wage-pressure was less fierce. If a wage-policy is to be agreed upon, therefore, it would seem essential that the government should not only increase taxation on profits, but also try to prevent profit margins from increasing. Otherwise stability and eventually the wage-policy-agreement would be endangered in a period of full employment and full demand. The exhortations recently addressed to entrepreneurs by ministers, and suggestions that the anti-monopoly legislation might be used to prevent an increase in profit margins demonstrate a growing realization of the importance of this point, and of the need to take *positive* action in a world of administered prices, as competition would not automatically achieve this aim. In my opinion far more stringent powers of price control will be needed and the sooner the government can be made to realize this the better. A very important task of educating the authorities and not merely the public faces the Council in this respect. It may well be possible to achieve the desired aim by giving tax (especially investment allowance) concessions to firms which agree to a standardized method of book-keeping and the maintenance of prescribed profit margins. Even then a number of seemingly perplexing problems will have to be resolved. What should be the policy for industries whose productivity is not increasing? How are price cuts to be enforced in those in which it is increasing more than the average? In an economy with a high rate of expansion these problems should be amenable to solution.

51. And these measures together should enable the country to accelerate the annual increase in physical productivity from the present roughly 1 per cent. per annum to something between 2 and 3 per cent. If rationalization of production were enforced by special measures in single industries a further gain of 1 or 2 per cent. per annum could possibly be attained. All this should go some way in creating the basis of a reconciliation of monetary stability and trade union demands for higher wages.

52. The argument has been used that such a reversal of policy would

stunt private initiative and endanger our very existence. These objections seem to ignore that throughout the post-war period—even when shortages made a far more stringent control necessary than would be required now—investment consistently expanded. Neither the willingness nor the ability to undertake investment was ever impaired. On the contrary investment had to be forcibly repressed, and is still being repressed far below the level which entrepreneurs were and still would be prepared to undertake. The threat to expansion comes from the need to use violent shocks to confidence as a weapon to repress investment. It is reliance on such non-discriminating means which endangers expansion, and the threat to expansion, in its turn, induces a restrictionist attitude to new techniques by trade unions and thus menaces the competitive power of the country.

53. I am in no position to judge whether trade union co-operation would immediately be forthcoming if a policy of balanced social justice were adopted There are certain indications that it might be. But if the recent strikes and the consequent wage increases they enforced have shown the futility of the illusion that 'freedom' and stability are compatible without unemployment, organized labour has not profited either. After two years of monetary disinflation, prices are still rising; not only wages. I do not believe that trade union leaders or the rank and file can be happy with this state of affairs: prices rise at each effort to catch them and nullify their gains. Efforts to protect wages and social service benefits by automatic escalator clauses are also self-defeating. As the inflationary trend is aggravated the trend towards dear money is also accentuated, as lenders fight shy of granting fixed money loans. The distribution of income becomes more unequal. The fact that several influential trade union leaders have called for a reform of the structure of unions seems to support this view. But trade unions are in an invidious position: co-ordination on wage-determination might be feared as undermining their authority. This fear has been immensely strengthened by suggestions, which lately have been voiced freely, that there should be unilateral wage-restraint enforced through deflation and unemployment, while business and land or houseowners were enabled, or even encouraged, to make use of all opportunities for gain. Yet the Australian example shows that compulsory arbitration certainly does not diminish the authority of the trade unions.

54. There is, however, an important economic argument against both wage-restraint and central wage-fixing. Both will tend to ossify the existing position and thus cause grave friction and retard adjustments. The vast complications of a modern wage-structure can only be mastered by those most concerned with them.

55. It should not be impossible to evolve a compromise solution which

would infuse central co-ordination without threatening the autonomy of individual unions and interfering in the details of collective bargaining. The fact that there are obvious and large gains to be derived from such a successful compromise would certainly make it easy to work. It is this beginning which is really difficult as the need to increase investment imposes a need for restraint in wage demands without any clear gain in social status or anything else, for some little time—perhaps 2 to 3 years.

56. Several ways are available to achieve the desired end. One would be to create a commission on which trade unions would be represented and which would have their confidence. This commission would then be entrusted with powers not indeed to *disallow wage-bargains*, or proscribe wage increases (as in Australia) but merely to *postpone or spread their coming into effect*. In a dynamic economic system where productivity is increasing appreciably through time, it would in effect have the result of bringing about a relationship between wages and productivity compatible with more or less stable prices. Thus the task of the commission would not really be either too complicated or even too difficult, provided it possessed the confidence of trade unions, and provided it would be assured that the government and the trade unions had come to some agreement on general economic policy.

57. Strict stabilization of prices in a world of dynamic change and in a system of individual enterprise would not be desirable. The accumulation of debt must be lightened from time to time. If this is not done through a slow depreciation of money, it will happen through periodic default induced by recurrent depressions. On the whole the former is less dangerous, and far less wasteful, than the latter used to be in the nineteenth century. What must be avoided is so quick and uninterrupted rise in prices as would give rise to anticipations, and thus become steadily accelerating. This, incidentally, would also stop the transfer of purchasing power from the 'rentier' to the entrepreneur and worker, so necessary for a smooth functioning of the free enterprise system. The rate of interest would rise to offset the anticipated depreciation.

58. No doubt all sorts of technical statistical difficulties would arise in connexion with the measurement of productivity, of international competitive power, &c., which would determine the actual quantitative details of the operation of such a controlled wage policy. But in practice—and given good will—these difficulties should not prove insuperable. As the Australian (and the Dutch) experience shows, they can be resolved and marginal mistakes can be corrected by postponement of further wage claims—*provided* the dynamism of economic expansion is maintained. There is no possibility of sharing what has not been produced: that lesson should by now have been learned.

59. The beginning will no doubt be difficult: but it must not be forgotten that the whole readjustment can easily be solved by increasing our productive investment by devoting to it resources which *do not amount to more than a few per cent. of total national income, or a few years increment in productivity.* It is the marginal character of the British problem which needs stressing, however intractable it proved to be in the past. But it must be said that the first period of a new policy will not be easy, and will demand statesmanship of a very high order all round.

60. The need for safeguarding expansion is the one point to be stressed. Faced with the Communist challenge, policies whose success necessarily depends in creating slumps, uncertainty, and hardships must be regarded—at any rate in Britain and Europe—as suicidal. We dare not fail. And that in the end is the best hope for success.

Postscript

The discovery of an economic policy technique which will permit a democratic country to combine monetary stability and full economic expansion is undoubtedly the most important problem before the Western World, faced as it is with the challenge of continued Communist growth. Success, in my opinion, will mainly depend on whether there is a possibility of finding a way in which the likely gain in production each year can be ascertained and distributed in a way as not to threaten monetary unbalance. From this point of view the appointment of the Cohen Council might have meant a decisive step forward. I was, however, from the first, perturbed by the composition of the Council and publicly expressed these fears.[1] Unfortunately, they turned out to have been only too well justified. The first condition of success is the confidence of the trade unions. This is not easy to win. They have been intensely suspicious of any interference with the 'freedom' of collective bargaining. And their suspicions have been much increased by the advocacy of controlling the upward movement of prices by monetary means alone, as they knew that this would inevitably involve unemployment.

The Report of the Cohen Council which supports this attitude will, therefore, cause immense harm and bedevil any attempt at solving this basic problem. The Council has disregarded the arguments and statistical evidence submitted in my paper; on various important points it made plain logical errors,[2] and brushed aside the growing under-employment of the economy and the increasing balance of payments surplus, and the

[1] *New Statesman*, 24 Aug. 1957.

[2] Cf. M. Lydall's letter to *The Times*, March 1958. It is interesting that Sir D. Robertson should have been involved once before in similarly elementary mistakes concerning wages and wage policy. (Cf. his letter to *The Economist*, 1955, p. 387.)

fact that large parts of the poorer areas of the world are suffering from increased distress. In its diagnosis that the rise of prices was mainly caused by excess monetary demand, the Council obscures all problems by considering the period since the war as a whole, instead of separating it into various parts. Yet it is clear that the situation in Britain had changed completely at the end of the Korean war. In trying to buttress its thesis, the Council once more trots out those statistical proofs of inflation which have been refuted in my paper. The most regrettable feature of the report is the passage in which the Council asserts (with surprising modesty considering the tone of the rest of the report), that it does not 'know of criteria by which to judge whether investment is too small or too large'. Here again the evidence submitted in my paper was not considered, as no reasons are given why the case I put forward was not accepted.

Two final points need to be made.

Britain is not alone in the world. She lives in a world economy rent in half by the cold war. It is therefore essential that her policy should not aggravate the relative decline of the free world, which is already threatened by a deepening recession. The Cohen Council attitude which tries to justify harsh deflationary measures by reference to the need for maintaining our short-run competitive power, even at the cost of our long-run productive capacity and productivity, represents therefore a rash advocacy of beggar-my-neighbour policies. The lesson of 1930–1 is entirely disregarded. It was this attitude which then turned a comparatively mild recession into a violent financial crisis.

Finally, a word on the long-run lessons. After 18 years of rising prices people seem to have forgotten the great lessons of history about the fatal effects of falling prices. Never, in world history, was a period of vital expansion coincident with falling prices. The ancient world from Hammurabbi onwards knew (and he and Moses seem, on the whole, preferable as statesmen to the latter-day wise men) that the burden of debt had to be lightened from time to time. If depressions and default are to be avoided, a slow rise in prices is needed. If it is accompanied, as it usually is, by vigorous expansion, it is less wasteful, on the whole, less unjust, and less unsettling, than recurrent crises in a world of stagnation.[1]

[1] Lloyds Bank in its *Review* for April 1958 (Table I, p. 41) implies that the 'Great Depression' and the fall in prices after 1870 was coincident with a vigorous rise in real output. Characteristically the decisive fact, in this respect, that in that period capital export from Britain fell sharply, is, of course, not mentioned. It would, of course, undermine present policies on the export of capital.

PRICES, PRODUCTIVITY, AND INCOMES[1]

By G. D. N. WORSWICK

I. Introduction

THE trend in productivity, real output, and real income in most countries of the world in the years since the Second World War has been fairly steadily upwards, with widely varying rates of increase at different times and in different parts of the world. It is possible that in some major countries, notably the United States, this upward trend will be interrupted in the next year or so, but there is a general belief that recessions or setbacks in economic activity will not be permitted to degenerate into a slump of the depth or duration such as was last encountered in the 1930's. The rising trend of production and real incomes has been accompanied by an altogether disproportionate rise in money incomes and in prices. Here again the experience has differed widely in different parts of the world, between different commodities and between different types of money income. At the time of writing this memorandum, for example, a substantial number of primary products are falling rather sharply in price on world markets and there are fears of even further falls. A prediction as to the future course of money incomes and prices in the world at large is extremely hazardous. A case can be made that the forces making for very rapid increases in prices and money incomes were generated during the second war, which left a legacy of other forces which have been gradually spending themselves and are now exhausted, so that consequently the diagnosis which we shall attempt to make in the course of this paper is already a piece of economic history. This is not my own view. For reasons which will become clearer as we proceed, I think that in a great many parts of the world the forces making for price increases rather than decreases will tend to predominate, though they may well be less strong than at times during the last decade. Moreover, new governmental policies are likely to emerge in order at least to slow up the trend in price increases.

The reasons why I have started with reference to the world context of prices and money incomes are twofold. On the one hand, part of the explanation of the rise in prices and money incomes in Britain is to be found in what is happening in the world outside. On the other hand, to the extent that the British increases originate inside the British economy the consequences of those increases for good or ill is again partly dependent on what is happening elsewhere. The problems with which we have to deal,

[1] This is a shortened version of a paper written at the request of the Council on Prices, Productivity, and Incomes in November 1957. Some of the principal omissions are noted in italics.

therefore, are already very complex, and there is a further complexity to be added, namely, that the process of price and money income increases has cumulative or self-stimulating characteristics, so that once it has got under way it is difficult if not impossible to reduce the process to any simple set of causes. This is not to say that there are not some who believe that the whole process is very simple, and they offer very simple 'solutions' to the problem. I believe that one of the best services which the Council on Prices, Productivity, and Incomes can make in an early report would be to explain that this is a complex business and is not likely to be solved by the wave of any magic wand. This is all the more important in that at the time the Council is likely to be reporting, a good deal of heat will already have been generated on the particular question of the contribution of British trade unions to the rise in prices in Britain. Secondly, the peculiar conjuncture of an American recession and falling commodity prices in world markets, combined with a continuation of price increases elsewhere, may well be causing additional confusion. These two factors are hardly likely to be conducive to a calm appraisal. Policies which may take months or even years to work out will be at a discount, and 'drastic' measures will be at a premium, irrespective of whether they will do good or even achieve any of the objects for which they are intended.

II. The Nature of the Problem

Retail prices in Britain have been rising at a rate varying between 3 and 5 per cent. per annum for the past 10 years or more. The presumption is that if no special measures are taken this rise may well continue. Does it matter?

This section proceeded to examine various problems associated with rapid price increases; the influence on the distribution of wages, salaries, profits, rents, and pensions; the influence upon the amount and distribution of savings; and upon the balance of payments on current and capital account. The question whether the increases which have hitherto been steady might not accelerate was examined. Finally a particular argument concerning the relation between full employment and productivity was taken up. This argument, and the conclusions of Section II, follow in full.

Full employment and productivity

There is a particular argument which I may call the 'full employment effect' which should be taken up here, although it anticipates the discussion of the next section. The argument here is that the price increases are indissolubly bound up with an excess of demand over supply, notably in the labour market. The economy, it is argued, is persistently attempting

to produce more than its productive capacity permits, and that consequently shortages and dislocations occur which, if not causing a decline in productivity, at least hold back the rate of increase. This argument has been used from time to time ever since the war, and various expressions, e.g. the 'empty economy', have been invented to describe it. Let us look at the possibly disadvantageous effects. A very high level of employment may encourage industrial indiscipline. In marginal cases this is obviously true, but the very fact that workers can leave at will with the certainty of finding alternative employment encourages managements to create the kind of conditions of work which will make their employees wish to stay with the firm. What some people call an undesirable irresponsibility, others might hail as a desirable independence. On this point I should of course declare my personal bias to the Council, namely that I support very strongly on social grounds the benefits to be derived from a very buoyant demand for labour. I rate very highly as an objective a state of affairs in which a man can leave his present employment and look for other with a hope of success if he finds his working conditions uncongenial in one way or another. Indeed, I regard this as the greatest of all the gains that have been made by post-war economic policy. But apart from this social gain, a fairly acute shortage of labour has two strongly beneficial effects upon productivity. The first is to make managements endeavour to adapt their working conditions to get some output from even the least promising employees. In the 1930's a very large number of people used to be included in a category called 'unemployable'. This category hardly exists nowadays. Secondly, managements are induced to become more and more machine-minded, to go for automation, and so forth, by the very fact that it is not easy to mobilize large numbers of unskilled or semi-skilled workers for new projects. This is wholly desirable. If demand were to slacken, in the short run, and possibly in the long run, the effect on productivity might be unfavourable. In the short run both management and workers would jointly indulge in various devices to spread the work so as to avoid open unemployment, and I think it would be found that in all instances since the war where the output of a major industrial economy has fallen away from the full employment trend, or even fallen absolutely as in one or two cases in the United States, the level of productivity per man has fallen even more sharply. The advocates of the 'shake-out' might argue that unemployment has never been sufficiently sustained for it to work. Ethical considerations apart, there is a singular lack of evidence that productivity would ultimately rise faster than if full employment were maintained. As to the other influences on productivity, the outstanding argument has been that if employment is very high stocks will be persistently low and therefore shortages emerge from time to time thus holding

back production. This could happen, but it has also been argued that the rising trend of prices (associated with full employment) would encourage excessive stock holding. I am inclined to think that, once a particular level of employment and a particular rate of increase of prices have become customary, manufacturers and traders adjust their stocks in real terms in relation to real turnover, in much the same way as they would do if prices were stable. In so far as the rise in prices is accompanied by a very high level of employment, the effects on productivity, on balance, would seem to be favourable. But, as I hope to show later, the association of rising prices and high employment is not a necessary one. If prices are rising and employment is not full, there is little reason to think that the price rises will influence productivity either way.

To sum up the argument so far: We originally asked the question whether a continuing upward movement of prices mattered. As regards the domestic economy our answer must be that it does not matter very much. The shifts in the distribution of real income often associated with rising prices did occur between 1939 and 1948, but since that date they have been much less marked. Hardships of particular classes, e.g. pensioners, could to some extent at any rate be alleviated by specific government action, at the cost of slightly speeding up the rate of increase of prices. On the other hand the price increases as such appear to be not unfavourable to expanding production, and if the British economy stood alone one might be prepared to accept the steady price increase and merely attempt to alleviate any harmful consequences. In practice the alleviation of hardship is not as easy as it sounds: statutory pensions can be raised, but it is much more difficult to devise satisfactory schemes to help old people living on private savings. As to the external consequences of price increases in Britain, these matter more or less according as to what is happening to prices elsewhere. We argued that there is always devaluation to correct any significant divergence of British prices from those of competing exporters. Certainly it is wrong to think of a further devaluation as a kind of national disaster. What might give concern both in its internal and the external effects is the fear that the process which has been going on for some time without any particularly harmful effects may continue and even accelerate. I do not think this is very likely, but it is not altogether satisfactory if people begin to fear that there is no means of bringing the movement under control. Consequently a demonstration that the general level of prices could be regulated is as important as the establishment of any particular level of prices. We shall attempt to outline ways and means of bringing the price level under control, but first we must attempt to analyse the causes of the movement which so far we have only described.

III. The Causes of Continuous Increase in Prices

An historical sketch

Historically the great upward movement in world prices with which we are concerned began with the Second World War. There had indeed been slight upward movements in this country and elsewhere in the 1930's, but the scale of these movements was altogether less than that which has been encountered during and since the war. One does not need to look very far for the causes of the movements during the war itself. The very large and rapidly growing government expenditures upon defence, coupled with simultaneous restrictions in the supply of raw materials to many countries or to particular industries, created a situation in many markets where demand manifestly exceeded the capacity of producers to supply their goods at the going price. To a greater or less degree this excess demand was not permitted to work itself out fully in price increases. Direct allocation of raw materials and labour frustrated altogether various kinds of expenditure which might otherwise have occurred, e.g. the building of cinemas or the purchase of motor-cars in Britain, while in other fields consumer rationing and price control were introduced. In consequence disposable money incomes continued to rise, but monetary outlay on consumption did not rise nearly so fast.

Excess demand, an aggregate monetary demand for goods and services greater than the capacity of the economy to produce, originated with increasing war expenditures, but it did not die away immediately war expenditures were curtailed after 1945. The very success of the war-time controls and rationing in frustrating demand of various kinds had left the accumulation of abnormally high personal savings and abnormally high savings of enterprises, which were not permitted to be re-embodied in equipment and plant during the war itself. When the war came to an end, what might be regarded as the 'normal' consumption demand originating from disposable income could be and was supplemented by an additional demand, especially for durable consumer goods, which could be financed from these war-time savings; and by the same token most companies were in a position of very easy finance for replacement and new development. In many countries the war-time controls were dismantled rather quickly, and in those cases the 'suppressed' inflation was allowed to emerge in the form of 'open' inflation of prices. The United States is an outstanding example. It is important to grasp the character of the post-war excess demand, because it explains why even very high taxation may in certain circumstances be insufficient to restrain demand within the capacity of the country to produce, and incidentally justifies the British policy of maintaining various allocation controls and consumer rationing for rather long periods after the war. It is not easy to pin down the exact point when one

might say that aggregate demand had once more come within fiscal control, but I am inclined to put the date for the British economy at somewhere about 1950. What I mean by this is that from then onwards one was justified in assuming that any reductions in expenditure brought about by increases of taxation of one kind or another would not automatically be made good by drafts upon past savings accumulations which people were anxious to spend. This perhaps should be qualified to say that this sort of actual or potential balance between demand and supply had been achieved in the sector of consumers' expenditure but not in the field of investment in buildings and equipment. The fact that firms have enjoyed quite extraordinary financial strength continuously since 1945 is certainly part of the explanation of how a boom in industrial investment could occur in the teeth of a credit squeeze. If we look at a chart of the course of prices, however, we find that the movement is continuous well beyond 1950 at a time when, as I have just argued, excess demand in the sense of an attempt to produce substantially more than the economy was physically able to produce had disappeared.

Money wages also began to rise during the war at a rate which has been maintained more or less continuously ever since. In the first instance, the demand for higher money wages was called forth by the rise in prices in the early stages of the war, causing a fall in real wages. The rise in money wages inevitably increased costs. These costs were not fully passed on to consumers in some sectors where subsidies were employed. The official cost of living index was actually stabilized from 1941 to 1947, but it is well known that that index was misleading, and the rise in retail prices was undoubtedly one factor making for increases in basic wage rates during the war. Two other factors must however be mentioned. Firstly, very large transfers of workers from one sector to another had to be brought about quickly. It so happened that the direction of movement was very frequently from low wage to higher wage industries anyway, and in general transfers could be made more easily if accompanied by some increase in wages. Secondly, employers themselves, confronted almost for the first time in living memory with a labour shortage, frequently assisted the process of wage increases by competitive bidding for labour. In the later stages of the war, this was largely brought under control, but it was a factor which emerged again in the post-war years. To sum up, we can maintain that historically the great rise in prices was set off in the first instance by new demand created by expanding war sectors, that this led to price increases and reductions in real wages which trade unions attempted to offset by increased demands for money wages. During the war various controls damped down this process, but in the post-war years, as controls had been gradually abandoned, the spiral of prices going up, money wages

following, costs then being raised and being passed through in higher prices, was given fuller rein.

The current problem

We come now to the crucial point in the whole of my argument, which is whether the spiral of wages and costs will die away once there is no excess demand in the economy at large. It is my contention that, while the historical association is there, once the wage-price movement has been set off there is no reason why it should not continue even in circumstances where there is no evidence of excess demand, or, to put it more bluntly, even when the economy is manifestly producing less output than it could do with the given labour force and industrial capacity. There are several reasons why it seems likely that this can happen. Starting from any initial position, let us suppose there is a 10 per cent. rise in money wages. It is well known that in manufacturing industry, and even more so in the distributive trades, entrepreneurs calculate the price they would wish to quote by making some estimate of their prime costs (labour and materials and other direct costs) and then add a more or less conventional percentage margin for overheads and a further margin for a reasonable profit. Even where there was price control during and after the war it became quite customary to feed through wage increases into higher maxima permitted by the price control regulations. Indeed in many cases the wartime price controls did little more than sanctify ordinary business practice, though there were attempts made from time to time, the last being in 1948, to put some squeeze on profit margins. In the absence of any official control the entrepreneurs have to ask themselves whether they can safely pass on the higher labour costs in higher prices. If the original wage increase is universal they manifestly can. Monetary demand for consumer goods and services from wage-earners themselves will have gone up and this higher monetary demand, supplemented by higher monetary demand from profits (if prices are in fact raised) will be sufficient to take off the market the same volume of goods at 10 per cent. higher prices.[1] Even if the wage increases only occur in one sector or another the entrepreneurs will have little hesitation in industries for whose products there are no very close substitutes, and they will be more inclined to raise prices once the process of price increases has already got under way. Even if there were open unemployment of 2 or 3 per cent., or even substantially more, in British industry, I cannot see why the spiral of wages and prices should not continue. On the trade union side, if prices continue to rise their members will continue to press for wage increases to catch up, and while trade union leaders might be deterred from wage demands if unemployment

[1] In this example I have, of course, taken no account of imports.

were 10 or 15 per cent., so that the argument that 'wage increases cause unemployment' (at best a very doubtful one) might deter them, they would hardly be deterred by a mere 2 or 3 per cent. of unemployed. A similar response might be expected from employers in the matter of price policy. They might become a little more doubtful about the dangers of competition from substitutes if there were some unused capacity in the economy, but they would still be concerned with retaining an adequate labour force and worried that if they do not grant wage increases they will lose labour, without which they would have no production to lose. Possibly the rate of increase of money wages might be somewhat slowed down, but it is less certain that the rate of increases of prices would be slowed down. In the above argument we have so far made no mention of productivity.

Productivity per man has in fact been increasing fairly steadily in British industry since the war (though, of course, at widely differing rates in different industries). To the extent that this happens labour costs do not rise as fast as wage rates. And if we return to the case where we assume the economy is brought back from full-capacity employment of the labour force to something less, the decisive question now becomes whether productivity will continue to increase at the original rate. It is here, as I have already indicated earlier on, that I have my doubts. If slackening real demand is met by work-sharing arrangements, output per man may well fall. Consequently, even if the effect of some slack in the labour market were to slow down the annual rate of increase of money wages, if this were accompanied by an equivalent fall in the annual rate of increase of productivity the rate of increase of labour costs, and hence of prices, would remain unchanged.

Reference was made here to Mr. Christopher Dow's paper in Oxford Economic Papers *for October 1956, which provides both theoretical models and a statistical account of the interaction between costs and prices in Britain between 1946 and 1954.* Mr. Dow does not claim, nor can it be proved, that this is the full explanation, and that the excess demand to which I have referred above may not have played an important role at particular times. Nevertheless, it is interesting that a plausible story can be told in terms of the cost and price reactions. Moreover he does expose very clearly the various factors which might be influenced in order to damp down the process. In particular, he stresses the importance of delaying tactics. If the rate of change of prices, which is running at the moment at the order of 4 or 5 per cent. per annum, could be reduced for a period of a year or two to 1 or 2 per cent. per annum, then a movement which might otherwise continue for quite a long time until prices have risen very substantially might die away much more quickly. All the above has of course been again very over-simplified. We have talked of prices in general and money

wages in general, and as though the production process was very simple. In real life the chain reaction is even more complex than has been described. Wages and imported materials and profit margins do not exhaust the factors making up the price of a product. Indirect taxes or subsidies must also be taken into account.[1] Further, there may be divergent movements between costs and profits in manufacturing and in the very substantial transportation and distribution costs. Indeed it is not at all easy to account for the movement in the retail cost of food between 1947 and 1956 without postulating some disproportionate rise in distributive margins (cf. Professor Ely Devons's interesting paper in the *District Bank Review* for September 1956 and also Professor R. G. D. Allen's 1957 Stamp Memorial Lecture). I hope very much that the Council will pursue the analysis of these other factors vigorously, because they have tended to be neglected in current discussion. Above all, the foregoing picture is over-simplified because of its suggestion that trade unions act together at the same time, whereas, as is well known, they act for themselves at different times, and it is this fact that wage increases occur at intervals with no particular pattern which makes the problem of stabilization of prices, entailing a reduction in the rate of increase in money wages, particularly intractable. I shall return to this point in my concluding section on recommendations. Meanwhile I want to go back to the other simplified model in order to make some observations about the influence of fiscal and monetary policy.

Fiscal and monetary policy

The problem of excess demand has not been an especially serious one in the last 5 years in the United Kingdom. There have been one or two periods when restraint of demand was desirable, particularly when account was taken of the balance of payments position, but fiscal policy has been quite sufficient to bring about any restraint of demand that was required. The resilience and flexibility of the economy and particular sectors of it to meet with increases in demand through overtime and other short-period ways of stepping up output is, I think, persistently understated. Even in

[1] In the popular version of the 1956 White Paper 'The Economic Implications of Full Employment' there is a little diagram which asserts that the basket of goods which cost £1 in 1946 cost about £1. 10*s*. in 1955. The pictorial explanation given for this is a 10*s*. note divided into three parts: 1*s*. 6*d*. changes in taxes and subsidies; 2*s*. increases in import prices; 6*s*. 6*d*. increases in home costs. This static way of presenting things can be very misleading. If we follow Mr. Dow's line of reasoning, an initial impetus can lead to a final increase in prices, *via* successive rounds of induced wage increases, several times the original rise in prices. The longer the process goes on the smaller, percentage-wise, appears the initial impetus. I would myself attribute to the cuts in food subsidies a greater responsibility for the rise in the general price level than is implicit in the '10*s*. note' presentation. By the same token, quite small subsidies to stabilize the cost of living over a period may check the cumulative process of wages and prices chasing one another.

these days of what is thought of as very high employment there are few manufacturing enterprises which would not be able to increase their output, for some months at any rate, by 10 or 15 per cent. without great difficulty. This is in contrast to the years immediately after the war, when not only fuel shortages but material and component shortages were fairly universal. Excess demand, to my mind, has not been the major problem in recent years except in so far as it has given rise to additional imports. As to that, I myself would be prepared to restrain imports directly by means of quantitative restrictions in the event of their appearing to rise too fast, and thus be less nervous about excess demand than a Chancellor whose doctrines set him very firmly against using this particular device. The dominant characteristic of cost and price increases of recent years has been that they are the working out of pressures from below in the process which is sometimes called 'cost inflation'.

At the present time, certainly, our real production is running at levels significantly below our industrial capacity and there is room for some considerable expansion of output based upon the big investment in industry in 1955 and 1956.

It can, however, be argued that the purpose of restraining aggregate monetary demand would not be to reduce output but simply to prevent prices going up. This is the crucial question, and the key to it is that, just as there is a floor put below money wages by very strong trade unions, there is equally a very strong floor below prices put by conventional price policies of British businesses, sustained in many cases by price agreements of various kinds. This stickiness of prices works both ways. If demand does exceed supply, firms are more likely to run up their order books and ration their customers rather than just to raise prices and charge what the market will bear. The most remarkable instance of this was, of course, the behaviour of motor-car manufacturers over many years after the war, when production for the home market at the prices they were charging was very much below what the home market was prepared to buy. Hence all the business of covenants and the rest of it. Equally, confronted with a contraction of demand firms are likely to curtail production and, if it is persistent, lay off workers, rather than to cut prices. In this context measures to make prices more flexible downwards, e.g. the elimination of resale price maintenance and so forth, may be of some help, especially where there is evidence that profit margins are excessive, but it has to be borne in mind that present conventions are deeply ingrained in British practice and too much ought not to be expected from 'making markets more competitive'. In this context we may look at the impact of monetary policy. The purpose of monetary policy, as I understand it, is to reduce somebody's spending on something somewhere in the economy. One

criticism of monetary policy, which we need not pursue here, is that reductions in the quantity of money do not even reduce anybody's spending, because they are offset by a corresponding increase in the velocity of circulation. But even supposing that monetary policy does begin to bite, and that somebody's outlays, either on investment or consumption, are reduced, the question remains whether the impact of this will be to cause prices to come down (or not to go up as much as they otherwise would), or whether the strain will be taken simply by reducing output. My fear is that the bulk of the strain would be taken by output, with very little effect on prices. Thus I would not deny that high enough interest rates, backed up by other more direct restrictions on the monetary supply, if sustained for a sufficiently long time might lead to a contraction in aggregate demand and hence to a fall in output and employment. But I do believe that the cost and price spiral, which we have described earlier, could continue to go on even in these circumstances. This is paradoxical, and does not fit in with the familiar categories of boom and slump, inflation and deflation which are the common coin of economic journalism. Nevertheless, I believe it to be the fact with which we are confronted. Even if this were not so, and reduction of demand did succeed in halting the rise in prices, what then? Would we be obliged thereafter always to run the economy well below capacity, for fear that if employment were to rise once more the rise in prices would start again? This is not just a matter of sacrificing a few percentage points in output for a year or so for the sake of the boon of price stability. We shall have to make the sacrifice each year—and more, for slack demand would, in all probability, reduce the *rate of increase* in productivity. Whichever way you look at it this does not seem a very sensible approach.

Referring back to the earlier arguments, I believe that, on balance, the present rate of increase of prices is excessive and must be brought under control. I think that at the present time price stability is a sensible objective, though I should not regard it as a permanent one. That depends on future movements of prices in the outside world. Reductions in demand by fiscal or monetary means may merely cause loss of output without significantly affecting the spiral of wages and prices. Accordingly we must find some alternative way of operating more directly upon the money wage and price level, and it is to that problem which I now turn.

IV. A Frontal Attack on the Problem

The foregoing analysis has been inevitably somewhat general and theoretical. Any practical proposals must recognize the complexity of the institutions, trade unions, trade associations, and so forth, involved and must take some account of prevailing attitudes towards the determination

of wages and prices. By way of preliminary, there is one particular attitude about which I must say something. The prevailing attitude towards collective bargaining among 'moderate' or 'official' opinion on both sides of industry is that the level of wages negotiated between employer and employee or his representative is a matter for 'industry' alone. Free collective bargaining has become one of the most sacred of our very numerous sacred cows. If one of the causes of the excessive rise in prices has been correctly ascribed in my previous analysis to the outcome of collective bargaining, then it follows logically that if I wish to restrain the increase in prices I am in fact advocating limitations on collective bargaining. The particular point to which I have so far drawn attention is the attempt of trade unions to restore (and to improve) real wages by raising money wages. Their claim that this is a matter for industry alone is manifestly not true, in so far as these higher money wages are pushed on into higher costs and ultimately higher prices. As consumers we are all to a greater or lesser degree involved in every wage claim. Trade unions, however, and employers for that matter, would rightly object to the view that the only issue at stake is keeping money wages in line with the general level of prices. They would point out that unions are also interested in the relative wages of one class of workers *vis-à-vis* another. This is quite true, and I suspect that part of the process of wage and price increases which we have witnessed in recent years arises as much out of relative wage considerations as of the attempt to secure any absolute average level of real wages for workers as a whole. If the final outcome each year of free collective bargaining was such that the average increase in money wages was of the same order of magnitude as the average increase of productivity throughout the economy, so that the general level of prices could remain unchanged, there would be less objection to free collective bargaining, though for my own part I am not especially impressed by the kind of real wage and salary structure which does emerge. Nevertheless, if the total increase of money incomes can be kept within the average increase in productivity, the particular dangers to which I have drawn attention earlier on would no longer be present, and I shall therefore confine myself to this narrower aspect of the problem.[1]

[1] My aim, that is to say, is to find means of keeping the aggregate increases in money wages within the limits imposed by the requirements of price stability, while leaving the factors determining *relative* wages unchanged. It has to be admitted that this perfectly proper logical distinction could not be kept over a long period of years, for two reasons. Firstly, it can be argued that *relative* changes can be more easily brought about if the general level of money wages is rising rather fast. No one believes that actual cuts in money wages could be brought about. Thus if the general level of money wages is rising only slowly, and no individual rates are allowed to go down, the scope for relative changes is smaller. There may be something in this argument, though, provided the rest of us will accept somebody else's increase as justified on general grounds, and not an automatic argument for an upward adjustment of our own wages, there should be plenty of scope for relative adjustments. Thus

I shall take as the objective the attempt to stabilize the cost of living over a fairly long period. It might in fact turn out that if the rise in prices in other parts of the world on a substantial scale should recur, so that some increase in prices in this country were desirable (as an alternative of an upward revaluation of the exchange rate), I do not think that difficulty would be found in relaxing whatever control and regulations are needed to secure price stability in order to bring about some actual increase in the level of prices. I shall confine my proposals also to the case where the intervention in the fixing of money wages and prices is, in large degree at any rate, the outcome of voluntary undertakings made by the principal parties concerned. What are the essential requirements of such a policy? Clearly the first requirement is that the government itself must undertake to stabilize the cost of living. The choice of the group of commodities which will constitute the 'cost of living' might itself be a matter for agreement between the government and the workers' and employers' representatives. How, it may be asked, can such a guarantee be given without a prior undertaking about money wage increases themselves? The answer is that the present time is a peculiarly favourable one for such an undertaking. The prices of imported food and materials have been steady or falling for some time, and even if these falls should be halted, or even reversed, it is unlikely that we shall in the near future encounter a very strong upward movement of raw material and raw food prices. It may be argued that the attempt to stabilize the cost of living by subsidies has been tried once already, and finally broke down because of the indefinite increase in the scale of the subsidies. It should be borne in mind, however, that on the previous occasion, from 1941 until the early 1950's, the government was attempting to swim against a very strong tide of rising food and primary product prices. The situation with which we are at present confronted is totally different, and the government is in a strong position, and has indeed been for some time, to undertake to

if the over-all increase for one year was 3 per cent., it could be used to give a 15 per cent. rise to one-fifth of the workers, provided the others had no increase at all.

The second argument is more cogent, namely that we can start off a policy of wage restraint by simply accepting the historically given structure of wage-rates. Thereafter either one grants a uniform rise to everyone, thus freezing *relative* wages for ever, or one does try to discriminate. If this discrimination is exercised by a central authority, 'principles' of some kind are bound to be brought into play.

For my own part I should not object to this, though I am alarmed by some of the 'principles' currently enunciated. For example the principle that wages in a particular industry can be increased if, and only if, there is an increase in 'productivity', could be most pernicious if, as seems to be what some of its advocates have in mind, productivity means physical output per head. For in the nature of the case the scope for increased physical productivity varies enormously. The output per man employed in an automatic factory could be 10 or 100 times greater than that of a man employed in an ordinary factory in the same trade. This does not seem to me to be a case for a tenfold or a hundredfold increase in wages. How does one measure the 'productivity' of an administrative civil servant?

stabilize the cost of living as the first move in negotiating wage and profit restraint for a period of years. Some people have argued that this should be accompanied by a moratorium on all money wage increases. But this would be a mistake. For if money wages were actually fixed for, say, two years, and meanwhile average real productivity continued to increase by, say, 6 per cent. over the whole economy, then with fixed percentage profit margins, prices ought to fall correspondingly, and this is more than is being sought. Total money wages in the first two years, that is to say, could be permitted to rise on the average by 6 per cent. without a threat to the price ceiling that is fixed by the government.

Various possibilities have been suggested as to how this result might be brought about. The first method is as follows. Ordinary collective bargaining proceeds as usual and reaches certain results, recommending an increase of 7 per cent. here, 5 per cent. there, 10 per cent. elsewhere, and so forth. No actual increases are paid in the first instance. At the end of the year all these 'notional' increases which have been granted are gathered together and an estimate made of the total increase in the wage bill which would be entailed. Meanwhile the economists and statisticians of the Economic Section of the Treasury have produced a figure of the maximum total increase in the wage bill which could be tolerated without breaking the price ceiling. Let us suppose that the first of these figures worked out at £600 million and the second worked out at £300 million. Then at the end of the year all the separate increases granted would be scaled down in exactly the same proportion, in this case by 50 per cent. According to this procedure free collective bargaining, in so far as it is concerned with relative increases between one section and another, would not be interfered with. All that would be involved is that the absolute increases would all be scaled down, leaving the same proportionate relative increases (relative to one another, that is), but keeping the total increases in line with price stability. This is certainly a scheme that could be explored.[1] There are, of course, obvious objections, namely that each individual group would know that it is likely ultimately to be scaled down in the increase that it gets, and it would therefore over-state its original claim. This of course is an objection to any rational allocation system where individuals or groups are asked to state what their demands are in order that they can be fitted into actual available supplies.

A second alternative might be this. Let us suppose that the statisticians have worked out that in the course of a year an average increase of 3 per cent. in money incomes, and more particularly in money wages and salaries, could be tolerated without breaking the price ceiling. Then, starting from the initial wage freeze, the government might announce that

[1] This suggestion was first put forward by Mr. C. R. Ross.

all money wage rates would be raised by, say 2½ per cent. in the coming year. This would still leave a sixth of the 'wages fund' for disposal. This might be used in a variety of discriminating ways. The first of these ways would help to overcome the immediate objection to any initial wage stabilization. Increases in money wages, unfortunately from this point of view, do not all occur simultaneously. There is a kind of circular queue of claimants who come up, some annually, some every two and some every three years, and indeed people more and more have got into the habit of thinking in terms of 'their turn' for a wage or salary increase. If the stabilization were to be introduced on 1 January 1958, that is to say, those who will have just had a wage increase would clearly welcome the proposal, while others who thought it was just about their turn, and indeed who might have already put a wage claim into the negotiating machinery, would feel very hard done by, and in many cases their bitterness would be particularly hard to bear. Some negotiating procedures take a very long time between the initial placing of the wage claim and the final decision, especially if the matter is carried to arbitration. But even without this the 'period of production' of a wage increase may last 6 months or more. And there is some evidence that the more well-behaved and moderate trade unions do have these longer negotiating periods. A moratorium announced on 1 January is thus more likely to hit the moderate and well-behaved people than the tougher unions who can get to the strike point much earlier. The pill could be sugared a little, therefore, if out of this special wages fund some automatic further increase above the over-all 2½ per cent. could be granted. For example, one might suggest a crude formula that you get an extra ½ per cent. increase for every year since you last had a wage increase. A second use of the special wages fund would be to permit wage increases in under-manned industries or in industries where it is universally agreed that wages are 'too low'. I am rather hesitant about introducing this second use of the special wages fund because this quite clearly cuts across the doctrine that the actual level of wages settled by collective bargaining is a matter for industry alone. Somebody, whether it be the Chancellor of the Exchequer, the T.U.C., or some special new over-all wages tribunal, will have to decide what constitutes under-manned or what constitutes too low.

The administrative working of either of the schemes suggested above would clearly be easier if at any rate the major wage claims could be synchronized rather than occurring at different times of year. If some informal machinery could be established for bringing the principal claims forward at the same time, interaction of wage increases in industry *A* on the prices of its products, and hence upon the living standards of workers in industries *B*, *C*, and *D*, would be immediately apparent.

I should guess that it would be unlikely that the principal trade unions, and it is the relatively small number of big ones which really matter in this, would agree to restraint of the kind suggested merely in return for an undertaking to stabilize the cost of living. They may argue that the 'capitalists' are getting away with it too easily, and they may well ask for further assurances about the distribution of dividends, about capital gains, and more particularly about distributive margins. There is little point, however, in my trying to imagine what sorts of terms trade union leaders might put forward as conditions of co-operation. What is important is that the initiative in reaching some sort of agreement to undertake wage restraint clearly lies with the government. The government should explain what the ultimate objective is, and the sort of restraint they wish the trade unions and employers (in price-fixing) to exercise, and then seek to find whether any common agreement can be reached which adds up to a complete policy.

The figures used in the above argument were primarily chosen for illustration. But, of course, the chances of success of a wage and price policy of this type do depend, in part, on what these figures actually are. Clearly the best chance is if the crucial figure, the annual rate of increase in productivity, is high rather than low. The best context for a high figure is one of high demand, so that various forms of disguised unemployment will be at a minimum, and high investment, so that productivity will continue to rise in the long term. As we saw earlier, investment itself is influenced by the current state of demand. To attempt to introduce a wage and price policy when production is being held stationary, by fiscal and monetary restriction, would be enormously more difficult than if production was expanding, being limited only by the capacity of the economy.

That really is the substance of what I have to suggest. But there are two additional points which are worth making. The first is this. Any policy of this kind, to be effective quickly, must inevitably be somewhat rough and ready. To the extent that it solves the problem of the too fast increase of prices, it will bring into sharp focus the issue of relative wages and other incomes. I myself would like to go forward from this position in order to secure a more logical and coherent wage and income structure in this country than exists at present. It is notorious that the actual earnings of individuals employed in many industries bear very little relation to the basic wage rates which are the subject of collective bargaining. I should like myself to see many industries following the example set by the coal industry in replacing their almost completely chaotic earnings structure with a more logical and simple system. This is desirable for its own sake, but it also means that the connexion between basic rates and actual

earnings will tend to become closer. Wage 'restraint' will apply to basic rates, and the beneficial effects on prices would be lost if earnings continue to be pulled up by competitive bidding. But here one must admit frankly that some of the opposition to any attempt to deal with the price problem will come from precisely those people who believe that any such attempt must logically lead on to the supersession of completely free collective bargaining. It is conceivable that if a somewhat rough and ready restraint could be held for two or three years, so that people come to believe in the possibility of continuing price stability, this might so modify price expectations, which, as I have already indicated, at present are held fairly widely that prices will continue to rise, that money wage claims will be brought within the bounds of productivity increases. To give an example, instead of coming forward with a demand for an 8 per cent. increase because we believe that prices are going to go up by 5 per cent. anyway, so that what we are really asking for is a 3 per cent. real increase, if people come to believe that prices are not going to go up they may modify the initial claim down to 3 per cent. If this were to happen, then one could cheerfully dismantle the temporary rough and ready restraint apparatus.

My second comment is that in one particular field the government does enjoy a peculiarly strong position for intervening in the wage-price spiral. It employs all civil servants, and for practical purposes determines the salary levels in a number of important professions, e.g. school and university teaching, doctors and dentists, quite a lot of scientists, and so on. Increases for the various classes concerned at the moment occur at different times on the ordinary leapfrog principle. If the government itself took the initiative in trying to grapple with this problem of securing the proper relatives between the different occupations, it would set a very good example to trade unions and industrial employers in what needs to be done in the longer run.

V. Conclusion

The causes and effects of the steady upward movement of prices in the last two decades are complex. Excess demand played a role in the war years and immediately after. But that is not our present problem, which has much more to do with the reciprocal interaction of wages and price levels.

The attempt to restrain price increases at the present time by reducing demand is misconceived. If demand is reduced and production falls, the price increases may not be halted if productivity falls at the same time. If prices were restrained, would the increases not recur when demand rose once more? To hold production back substantially below our capacity would entail not merely a once-for-all loss of output, but would very

probably reduce the rate of increase of productivity. Industrialists will not invest with any confidence if capacity is under-utilized.

Much of the current talk of 'pausing', 'taking breath', 'making sacrifices for the common good', is beside the point. The sacrifice called for should not be of production, but of misconceptions. In approaching the trade unions the point to be made is not that they are being asked to refrain from asking for rises in the real standards of living of their members, but that their demands should be formulated in a more systematic way. Uncontrolled rises in money wages do not in fact achieve rises in real wages in anything like the same proportion, for wage-earners as a whole. What is true for any one group, at the time of its money wage increase, is not true of the whole community. The approach, therefore, needs to be to the head, to reason and common sense, to make orderly arrangements which may bring as much, or even more, to the wage-earners themselves as the present unorganized and unco-ordinated collective bargaining.

Restraint in changes in basic rates will be frustrated if employers bid up earnings in a competitive scramble. They too need to exercise restraint. Moreover if average prices are to be steady, some prices must come down while others go up. Employers need to get into the habit, especially in manufacturing, of reducing prices.

The first steps towards a wage and price policy should clearly be voluntary. It is a matter of getting the government, trade unions, and employers round a table to see how far voluntary undertakings can go. Some legislation may be called for, or at any rate the promise of legislation, if voluntary appeals fail. One cannot say much about this until specific requests for restraint are put by the government, and specific measures are asked for by employers and trade unions.

In this memorandum I have tried to steer clear of political controversy, but as a result the reader may be beginning to suspect that I am living in a political dream world. It has to be admitted that much of what I have said is not very acceptable to Conservative doctrine, and cuts across recent Conservative government actions and motivations. Conservatives have tended to urge trade unions to 'keep out of politics' and to concentrate upon 'industrial' questions. They have advocated 'freedom' in economic relations. The logical implication of this position is that the job of trade union leaders is to do the best they can to get higher money wages and better working conditions for their members. What I have been suggesting is that the wage and price spiral cannot be halted by purely economic devices, and that the solution is a political one, in which the government has to play an important role.

I ask that the government should give guarantees about the cost of

living, which might well entail the use of subsidies and possibly, in some sectors, price control. But Conservatives do not believe in controls. They have been reducing the food subsidies. In terms of the analysis of this memorandum the Rent Act is likely to give additional impetus to the wage-price spiral.

I have argued that the price problem is not now one of excess demand, of overloading the economy, of 'trying to do too much'. Support for my view can indeed be found in the government's *Economic Survey for 1957*. I think that diagnosis was largely correct, and I can think of nothing which has happened since March this year to suggest that it was not. But the recent actions[1] of the Chancellor of the Exchequer can make sense only if it is supposed that *either* (i) he has changed his mind and now thinks there is excess demand, *or* (ii) he wants to reduce the level of employment. If it is (i) I think he is now wrong. As to (ii), I have argued that such a policy would be unethical and, moreover, unlikely to achieve the result aimed at. At best it could do so only at the cost of forgoing current production, and probably future productivity increases as well.

The present economic circumstances are quite exceptionally favourable for securing, not merely a temporary stability of the general level of prices in Britain, but for working out arrangements which will keep the movement of money wages within bounds thereafter. But it would be naïve not to recognize that the political conditions are not favourable. It is not only that the positive measures needed are ones which the present Conservative government might in any case be rather reluctant to take, but that at the moment their policy is moving rather rapidly in a different and dangerous direction. I say dangerous advisedly. It is not simply that the economic measures are wrong: they can be reversed. The danger is that they may cause a hardening of attitudes, particularly in the trade unions. The policy I recommend calls for discussion and negotiation upon the basis of certain common objectives. The hope of success depends on the existence of a general political climate favourable to the giving of voluntary undertakings. I do not think that climate exists today, but I am sure that the pronouncements of the Council can contribute towards its restoration.

MAGDALEN COLLEGE
OXFORD

[1] This refers to the measures announced in September 1957 when Bank Rate was raised to 7 per cent.

OXFORD ECONOMIC PAPERS

Volume 10. February 1958. Number 1

CONTENTS

The Excess Demand for Labour. A Study of Conditions in Great Britain, 1946–56. By J. C. R. DOW and L. A. DICKS-MIREAUX . 1

The Eisenhower Administration and the Recession 1953–5. By A. E. HOLMANS 34

Intertemporal Relation of Demand and the Preference System of the Firm. By SYED AHMAD 55

The Development of the Tied House System in London. By D. M. KNOX 66

Insurance Companies and the Finance of Industry. By G. CLAYTON and W. T. OSBORN 84

The Methodology of the Theory of Return to Scale. By DAVID SCHWARTZMAN 98

Valuation, Demand, and the 'Anti-Giffen' Case. By MURRAY C. KEMP 106

In Defence of Public-Utility Price Theory. By M. J. FARRELL . 109

THE ECONOMIC JOURNAL

The Quarterly Journal of the Royal Economic Society

No. 269 **MARCH 1958** **Vol. LXVIII**

I. *Articles*

Equilibrium and Disequilibrium: Misplaced Concreteness and Disguised Politics — F. MACHLUP

On Psychological Treatment for the Classics (Review Article) — A. L. MACFIE

The Economic Framework of a Theory of Growth — J. H. POWER

The Rate of Interest, the Marginal Efficiency of Capital and Investment Programming — W. H. WHITE

The 1957 Investigation of the Financial Condition of the United States — S. E. HARRIS

The Problem of the Peak, with special reference to Road Passenger Transport — G. J. PONSONBY

Notes on Countervailing Power — A. HUNTER

British Inter-Industrial Earnings Differentials 1924–55 — P. HADDY and M. E. CURRELL

II. *Reviews*

III. *Notes and Memoranda*

IV. *Recent Periodicals and New Books*

MACMILLAN & CO., LTD., LONDON, W.C.2

Application for Fellowship to

ROYAL ECONOMIC SOCIETY, 21 Bentinck Street, London, W.1

Industrial Innovation Series

THE *Industrial Innovation Series* incorporates the results of a programme of research undertaken by members of the Department of Political Economy of University College, London. Economic progress depends upon the capacity of industry to introduce a rapid succession of new products and new processes. What are the circumstances which predispose an industry either to welcome innovations or obstruct them?

The authors describe and analyse what has actually happened in seven different industries in the United Kingdom, where either the products are recent inventions or the methods of manufacture have been profoundly affected by recent changes in technique. They pay particular attention to the effect on innovation of the structure of the industry, in other words, whether its organization is predominantly competitive or monopolistic.

Volumes published.

The Economics of Man-Made Fibres. By DOUGLAS C. HAGUE. 30*s*.
The Women's Outerwear Industry. By MARGARET WRAY. 30*s*.
The Economic Development of Radio. By S. G. STURMEY. 30*s*.
The Economic Development of Detergents. By W. J. CORLETT. 25*s*.

GERALD DUCKWORTH & CO. LTD.
3 HENRIETTA STREET, LONDON, W.C. 2

AMERICAN ECONOMIC REVIEW

CONTENTS

VOLUME XLVIII MARCH 1958 Number 1

ARTICLES:

INSTITUTIONALISM AND WELFARE ECONOMICS — M. A. Copeland
CHANGES IN RETAILERS' BUYING — R. P. Mack and Victor Zarnowitz
THE SUPPLY OF STORAGE — M. J. Brennan
FOREIGN TRADE, BALANCED-BUDGET MULTIPLIERS — F. D. Holzman and Arnold Zellner
THE CLAYTON ACT: SLEEPING GIANT OF ANTITRUST? — R. W. Harbeson

COMMUNICATIONS:

TIME-PREFERENCE AND ECONOMIC GROWTH — Wassily Leontief
NEUTRALIZATION OF CURRENCY FLOWS — L. M. Valentine
INTERMEDIARIES AND MONETARY THEORY — J. M. Culbertson
REPLY — J. G. Gurley and E. S. Shaw

The AMERICAN ECONOMIC REVIEW, a quarterly, is the official publication of the American Economic Association and is sent to all members. The annual dues are six dollars. Address editorial communications to Dr. Bernard F. Haley, Editor, AMERICAN ECONOMIC REVIEW, Stanford University, Room 220, Stanford, California; for information concerning other publications and activities of the Association, communicate with the Secretary-Treasurer, Dr. James Washington Bell, American Economic Association, Northwestern University, Evanston, Illinois. Send for information booklet.

PRINTED IN GREAT BRITAIN, AT THE UNIVERSITY PRESS, OXFORD
BY CHARLES BATEY, PRINTER TO THE UNIVERSITY